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THE

INVENTORS' ADVOCATE,

AND

JOURNAL OF INDUSTRY;

A BRITISH AND FOREIGN MISCELLANY

OF

SCIENCE, INVENTIONS,

MANUFACTURES, AND ARTS.

VOLUME III.

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THE

INVENTORS' ADVOCATE,

AND JOURNAL OF INDUSTRY;

A WEEKLY BRITISH AND FOREIGN MISCELLANY OF

INVENTIONS, TRADE, MANUFACTURES, LITERATURE, AND THE ARTS.

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THE FRENCH EXPEDITION OF DISCOVERY TO THE SOUTH POLE.

The ships *Astrolabe* and *Zelée* which were fitted out for exploring the Antarctic Seas, were at Hobart Town when the last accounts were received. The Captain of the *Astrolabe* has sent an interesting report to the French Minister of Marine, dated the 19th February, of their second attempts to penetrate the ice and explore the unknown regions of the South Pole. From this report we make the following extract:—

"Only two days have elapsed since my return to Hobart Town, and I hasten to communicate the results of our second excursion in the polar regions of the south. Notwithstanding the fatigues, the dangers, and the terrible disease which afflicted the crew in my first expedition, I took upon myself the responsibility of hazarding a second, in a part of the globe exactly opposite to that which had been pointed out to me. Two powerful considerations induced me to take this course; in the first place, that part of the world had never been explored, as no navigator had penetrated beyond the 59th deg. of latitude; in the next place, according to the observations of the dip of the needle, in latitudes much less elevated, philosophers had been led to place the austral magnetic pole in the parts I intended to explore.

"We set sail from Hobart Town on the morning of the 1st of January. On the 10th of that month, we passed close to the latitude and longitude assigned to the "Royal Company" island, without seeing land or any indication of its proximity. From the 12th of January, M. Dumoulin made observations on the dip of the needle at all times that the state of the sea permitted, and he found that it continued to increase with great regularity from 74 deg. to about 86 deg., beyond which we were prevented from advancing. The temperature regularly and uniformly diminished, until the 16th of January, at which time the thermometer was only two deg., both in the air and on the surface of the sea. On that day we crossed the route of Cook in 1773, and from that time we entered on a part of the ocean that no ship had ever previously traversed. The next day, when in 60 deg. of latitude, and 140 deg. of longitude, we saw the first ice; it was a shapeless mass, fifty feet high and about 200 broad. From that time we continued to see similar masses of ice every day, but they were at great distances from each other, and not of large size. As we had scarcely any night, our course was until the 17th attended with little danger.

"After that day, however, when in the latitude 62 and 63 deg., the masses of ice became numerous, and formidable in size; many of them being from 300 to 400 toises wide, and 100 to 130 feet high. Flakes of snow began to fall, and often limited our visible horizon to 100 or 200 toises. On the day following, we counted 60 icebergs around us. It now required the greatest vigilance to avoid running against these formidable masses of ice, or being drawn against them by currents during temporary calms. On the 19th, in 65 deg. of south latitude, the cold was very intense. Some penguins flew about the ship, and in the evening in 66 deg., the masses of ice almost entirely covered the horizon within our view. The wind had fallen, it was a complete calm, and we were unable any longer to manœuvre the ships. Fortunately, we had been enabled to place them in a position rather free from ice, between two ranges of enormous icebergs, that sheltered us entirely from the waves.

"We had already been deceived by false appearances of land; therefore we had become doubtful of appearances of this kind; nevertheless, in the evening, a long, low, uniform brown line, ranging from south to west-south-west, attracted my attention by its permanence as well as by the continuance of the same color and forms. I felt convinced that it was land, though a number of persons on board were of a contrary opinion. Unfortunately, the day of the 20th, although the sky was clear and remarkably beautiful for such a climate, did not afford a breath of wind. We remained fixed to the same spot, experiencing the fate of Tantalus, in the sight of that land which excited our impatient curiosity to explore it. Our joyous sailors, who had only left off fresh meat two or three days, and who, without exception, were in excellent health, conceived the idea of amusing themselves this fine day with a ceremony of their invention, similar to that of baptism on crossing the line. On this occasion, the father of the Antarctic regions, at the head of his burlesque cortège, came to admit us into his territory, for it was an invitation which every one of us was obliged to submit to. I yielded with a good grace to these pleasantries, the officers did so too, and it was a complete fête day for the crew of the *Astrolabe*. It is needless to say, that the ablutions in cold water were dispensed with, as the temperature was not suitable for that part of the ceremony of baptism, but they abundantly made up for the omission by internal ablutions with a warmer fluid. Nevertheless, all went off remarkably well, and without any disorder.

"On the 21st, at one o'clock in the morning, I took advantage of a slight breeze to sail to the south-south-west towards the land. To arrive at it, we had to pass an immense range of table-shaped icebergs of very large size. I selected the most open part, and we sailed through the channels between the ice, which in many parts were not wider than three cables' length. In these narrow channels, our ships seemed buried under resplendent walls of from 100 to 150 feet perpendicular height, whose enormous masses appeared ready to annihilate us. The channel would then suddenly become wider, and we entered a spacious basin of water surrounded by icebergs of the most irregular and fantastical shapes, which presented an extraordinary appearance, and called to mind the chrystal and diamond palaces of fairy tales.

"A clear sky, delightful weather, and a favorable breeze, were of great assistance to us in this dangerous navigation. We at length got out of these winding and contracted channels which had for some time excluded the sight of the land, and we found ourselves in an open space comparatively clear of ice, where we could behold the coast in all its visible extent. Distant from us at that time about eight or ten miles, it appeared to extend out of sight from the south-south-east to the west-south-west, about 200 to 300 toises in height, and entirely covered with snow and ice, which had completely levelled the top, leaving, however, ravines on the declivities of the land, as well as the bays and the head-lands. In some parts, the ice presented a plain uniform surface of a dull white color; in other parts, the surface was cut up and thrown together as if it had been exposed to a violent convulsion, or had been suddenly and irregularly thawed. A great number of icebergs recently detached from the shore still remained near it, and frequently prevented all approach. This solid barrier obstructed all progress towards the south.

"From the declination of the needle, it appeared that the austral magnetic pole could not be far distant, toward the west. M. Dumoulin had already observed a declination of 86 deg., and as I was favored by a breeze from the east-south-east, I determined to attempt to reach the magnetic pole. Our ships sailed along the coast for five or six miles, saluted from time to time by the cries of the penguins. At noon we took accurate observations, and found the latitude to be 60 deg. 30 min. south, and the longitude 138 deg. 21 min. east. All the ships' compasses moved about in an extraordinary manner. The newly-discovered land, therefore, extended under the antarctic polar circle, since the direction of the coast was nearly east and west.

"At five o'clock in the evening the breeze was succeeded by a calm, and I took advantage of it to

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send Messrs. Dumoulin and Coupvent to a large floating piece of ice two miles distant, to make magnetic observations with greater accuracy. These operations occupied them three hours, and they returned to the ship at half past nine o'clock. Up to this time we had closely examined the shore through our telescopes, and had not been able to discover a single spot that the ice had left uncovered. Notwithstanding the improbability of a mass of solid ice being 1,500 feet high, some doubts were still entertained respecting the existence of land. At length, at about half-past five o'clock, after many disappointments occasioned by false announcements by the men on the look-out, M. Duroch directed my attention to some black spots on a part of the shore next to us, which had hitherto been concealed by a long range of icebergs. After examining them for a few moments, all doubt was removed, and I became convinced that they were rocks; at this point, the ice had left the coast bare to a certain distance. I hesitated at first to send boats so far from the ships (nearly six miles) for I knew that the winds were very uncertain, and the fogs thick and frequent. It was a frightful idea; to risk being obliged to abandon to inevitable destruction the people in the boats, should the winds force me to bear off suddenly from that dangerous coast. Trusting, however, to my good destiny, and the appearance of the sky, and fearful of not again having so good an opportunity, I sent a boat from each ship towards that part of the coast.

"Messrs. Duroch, Dumoutier, and Le Breton embarked in my boat; Messrs. Dubouzet and Leguillon in that of Captain Jacquinot. The sailors, who were inspired with the same ardor and enthusiasm as their officers, rowed with great vigor, and by eleven o'clock at night the two boats returned on board, after having accomplished their arduous and laborious duty. Each party brought back specimens broken from the rocks, consisting of granites of various colors, more or less worn by the action of the waves. They also brought some penguins, which appeared to me to be of a different kind from those we had observed in our first approach to the ice. M. Dumoutier also brought me some pieces of a large sea weed that had been thrown by the waves upon the rocks. They did not perceive any other trace of organised being, either in the animal or vegetable kingdom. In the presence of all the officers and crew, I gave the name of a *Terre Adélie* to the newly-discovered land, in honor of my wife.

"In the night, and on the following day, the 22d January, I contrived to follow the tract of the land at a distance of two leagues. The weather continued very fine, but it was excessively cold. In the night the mercury fell to 5 deg. below zero, and in mid-day water thrown upon the deck froze immediately in the shade."

On the 23d of January, the weather, which had till that time continued very favorable, changed, and the ships became surrounded with dangerous masses of ice, and a high wind and snow added to the dangers of the navigation. The cold was so intense that it was with difficulty the sails could be set, and it was necessary for the men to relieve one another every hour. During a thick fog, the ships became separated, and for some time it was thought that the *Zelée* had been sunk by striking against the icebergs. These fears, however, proved groundless, and on the 26th the two ships were again in company, and free from any immediate danger. On the 30th of January, in 64 deg. 30 min. south latitude, and 129 deg. 54 min. east longitude, the land was again seen, though the appearance of it was not so decidedly marked as to remove all doubt whether the high ridge observable might not be ice. The magnetic needle, instead of inclining to the north-east as before, had, during the three days of tempestuous weather, changed its direction, and pointed towards the north-west, which indicated that they had during that time passed the magnetic meridian. Messrs. Dumoulin and Coupvent are of opinion, from the observations they made, that the point of the austral magnetic pole is situated on the coast of the newly-discovered land.

On the 1st of February, the two ships put about on their return to Hobart Town, having, as M. Dumont d'Urville observes, "completed their task, and considering that the *Astrolabe* and *Zelée* might then retire honorably from the lists, after having furnished a valuable contingent to geographical and scientific knowledge."

SILK POWER LOOMS AT LYONS.

The *Courrier de Lyon* gives the following description of a new application of power looms at Lyons for weaving silks:—

We were permitted, some days ago, to visit a manufactory, which has greatly excited our surprise and admiration; in which the process of weaving by machinery is applied to silk fabrics. In the looms of this manufactory the rails are lifted up and down, the weft is pushed together, and the shuttle passes backwards and forwards with the utmost regularity and swiftness. In fact, after counting more than once, we found that the shuttle passed from side to side upwards of a hundred times in a minute; by this means, therefore, more than a metre (about one yard three inches) of tissue can be made in an hour; and, consequently, ten, twelve, or fifteen metres in a day, according to the articles manufactured, and also according to the beauty of the silks employed.

But what kinds of silks are made at these looms? many readers will ask—gauze, no doubt, or coarse tissues of little value. No; we have seen in this factory, where from 25 to 30 looms were set in motion by a very small moving power, silks which were intended for umbrellas, serge for lining, and very beautiful satin of all colors, and of different qualities. The pieces that were made under our inspection, varied from 2,800 threads to 6,400 in the warp, in the breadth of the stuff, which is half a metre. The texture of the pieces that we examined seemed to be extremely regular, and their appearance very fresh and bright, particularly the rose-colored and white satins, and other delicate tints. It may be readily supposed that this would be the effect of the silks woven by power-looms, since the silks made by machinery is not liable to injury from inattention or the want of skill, like that made by hand; and the mechanism by which the shuttle is propelled is free from the objection of staining the silk by perspiration, to which that made by hand is liable.

It must not be supposed, however, that these power-looms can work for a whole day like a watch without any assistance. It is at present requisite, and will perhaps always be so, on account of the nature of silk twist, that there should be a person to overlook each loom, in order to change every five or six minutes the roller on which the woof is wound in the shuttle, and to piece the broken threads. The great advantage arising from this mode of weaving, as regards the workmen, is, that they are no longer obliged to sit stooping over the loom all day long, moving their arms backwards and forwards like a machine. The young women whom we saw seated quietly beside the looms, of which they had the care, presented all the appearance of contentment and happiness.

The improvement introduced by this machinery will effect the physical emancipation of the Lyonese silk weavers. The inventor, M. Guigo, by successive improvements in the machine, which enable him to manufacture beautiful and strong tissues, will have rendered a service to this interesting class of our population, similar to that which Jacquard rendered to weavers, by simplifying the loom so as to avoid the necessity of throwing themselves into those contorted positions, which deformed their bodies and shortened their existence.

Since viewing M. Guigo's manufactory, we have made inquiries with a view to ascertain whether the results we had observed, and were so delighted with, could be depended on for a continuance, and we have ascertained, from sources the most direct and the least liable to suspicion, that, in all cases, the satins made in these power-looms are distinguished by the regularity of their texture and the brightness of their tints. We also understand that no similar manufactory exists in England. Some of our townsmen recently arrived from that country have indeed seen raw silks (*soies écrus*), or common silks, manufactured in power-looms, but not serges and strong taffeties, still less satins of the finest qualities.

This application of power-looms to the weaving of silk, will, in another respect, be of great importance to Lyons, as it will be the means of bringing back to the town that manufacture of plain silk-stuffs which had become dispersed about the neighboring country to a distance of from twenty-five to thirty leagues, since the deplorable riots in 1831, and those of 1834.

ON THE USE OF TURF IN MANUFACTORIES.

M. Vivenot-Lamy has addressed a letter to the editor of the *Ancre*, in reference to an article on the use of turf in iron manufactures, which we recently translated from that journal, communicating the results of some experiments he has made on the subject. The object of the experiments was, to ascertain the quantity of heat given out by turf in burning, compared with other combustibles. The following are some of the results:

One kilogramme of wood, containing 25 per cent of water, evolved 27 parts of caloric.

Dry wood	36
Charred wood	39
Wood charcoal	75
Turf (according to quality)	25 to 30
Turf charcoal	63
Coal	60
Coke	66

It is remarked that turf charcoal appears preferable to coal in the manufacture of iron; it is almost equal to wood charcoal. The following are the results of some other experiments:

First, as regards the weight of different fuels. Taking pieces of equal size, it was found that fir charcoal weighs 6; the charcoal of hard wood 8; coke 9; the charcoal of turf 12; and coal 21.

Secondly, as regards their relative durations on the fire. The charcoal of hard wood and other woods mixed, lasted 36 minutes; the charcoal of turf 60 minutes.

Third, as regards their relative value. Taking as a ground of comparison a cask of charcoal, (250 litres), weighing 50 kilogrammes (about 106lbs.), valued at three frs.; turf charcoal that would yield an equal degree of heat would cost, in relation to its weight, 5 frs. 14 c., in relation to its lasting qualities 4 frs. 80 c. All these calculations, however, vary according to the different qualities of the turf.

"I have employed," continued M. Vivenot-Lamy, "turf in its natural state, and turf charcoal, for different purposes, and the following are the results of my observations:

"Turf in its natural state, when placed on the grate of puddling furnaces, produces a long flame, but the heat I believe to be insufficient in the ordinary construction of these furnaces. I think that turf compressed and dried in a furnace, could be used with decided advantage. Can it be used in blast furnaces? This is a question on which I dare not give an opinion. I have successively employed wood charcoal, charred wood, green wood, and coke, but not having a sufficient quantity of turf charcoal, I have not yet tried that combustible. The quantity of cinders contained in this fuel, appears to me to be the only difficulty to be overcome. These observations on the appli-

cability of turf, led me to conclude that if each kind of combustible, like other things, were applied to its proper use, the resources of industry would be considerably increased. I will mention an example in confirmation of this opinion. The numerous manufactures of earthenware and glass, in the forest of Argonne; the combing of wool for the manufactories of Rheims, Rethel, Vouziers, and their environs, consume annually about 40,000 bundles (*stéres*) of wood. To this quantity may be added a large portion used for domestic purposes. This consumption might, however, be advantageously supplied by coal and the charcoal of turf."

ON THE EMPLOYMENT OF THE GASES THAT ISSUE FROM BLAST FURNACES.

M. Elbernen, a mining engineer, has prosecuted the inquiry respecting the practicability of using the gases that escape from furnaces, with great assiduity, and with the following results.

1st. For a furnace like that of Clerval, which produces 3,000 kilogrammes of melted metal in twenty-four hours, and which consumes 122 parts of fuel for every hundred of melted metal produced, the quantity of heat disengaged each minute by the combustion of gas is 11,000° (11,000 *calories*) which equals that required for a steam-engine of 26 horse-power.

2d. The quantity of heat requisite to raise the temperature of the volume of air which issues each minute from the chimney, is easily ascertained, from the known specific heat of air. The volume of air thus expelled is estimated at upwards of 13 cubic metres.* The quantity of heat thus measured is equal to 1,410°, and represents 0.128 of the total heat generated. This is, therefore, enough to heat the air for the blast, and to produce a sufficient quantity of steam to keep the blowing apparatus in action, which requires a force of about seven or eight horse-power.

3d. If the heat from the furnace mouth is wanted for the drying of wood, by making the burning gas pass through the combustible, it is found that, supposing the steam and the gas pass together from the drying apparatus at a temperature of 100°, the quantity of water expelled in a minute would be 15 kilogrammes; a quantity corresponding to that in 62 kilogrammes of green wood. The total heat would therefore be sufficient to dry the wood consumed in ten blast furnaces at least.

4th. The temperature of the fusion of the melted metal being estimated at 1,200°, it might be produced by the combustion of the gases, since in the most unfavorable cases the temperature produced by burning the gaseous mixtures is as high as 1,259°, and it might be raised to 1,394° by the use of air heated to 200°, the gas having at least a temperature of 100°. Gases completely dry, at the temperature of zero, and where combustion is supported by air at zero, yield a temperature of 1,399°. The same gases at zero, burnt by air heated to 300°, produces a temperature of 1,502°.

5th. In all cases, the volume of air requisite for the combustion of the gases ought to be nearly the same as that admitted into the furnace, and it may be estimated at two thirds or three fourths of that ejected from the chimney. It must be admitted, that it generally requires nine cubic metres of air per minute to burn the gases of a blast furnace, that produces 3,000 kilogrammes of melted metal in 24 hours; or three cubic metres for every 1,000 kilogrammes of metal produced in a day.

CULTURE OF THE TEA PLANT IN BRAZIL.

We have before referred to the subject of Brazilian Tea, the importation of which is now prohibited. As the cultivation of that plant in South America may be little known to many of our readers, we may mention the following particulars:—

A distinguished French botanist, M. Guillemin, was sent in the year 1838, by the Minister of Commerce, to the Brazils, for the purpose of studying the manner in which the Tea plant is cultivated there; it had been imported from China into the Brazils about twenty years ago

The following particulars were collected by M. Guillemin:—

"The Tea plant is cultivated in several parts of the Brazils, near Rio de Janeiro, in the province of Minas Geraes, and particularly near St. Paul, about eighty leagues from the capital. In some parts of the country, the plant is cultivated very extensively; thus M. Guillemin speaks, in his report, of M. Feijo, President of the Senate, and M. Anastasis, who possess respectively 20,000 and 60,000 feet of Tea plants, most of which are six or eight years old. The plants are set in regular lines, distant about five feet from each other; each plant also is distant from the others by about three feet four inches.

"The Tea-plant is commonly gathered in the months of October, November, December, January, and February; but the leaves and buds may be gathered all the year round. A good workman can gather nearly sixteen pounds in the day. Many cultivators mix all the leaves together, but others separate the youngest leaves for the 'Imperial Tea;' while the less tender constitute the 'Hyson,' and other less esteemed varieties.

"After having been gathered, the leaf is submitted to the following processes, viz., *dressing* and *drying*. In the first place, the leaves are exposed to a certain heat in a large open iron basin, placed over a furnace. They are properly *dressed* as soon as they become supple, and will admit of being rolled up without breaking. This done, they are all placed on large bamboo-nets, and rolled about in all directions for about half an hour, until the leaf is properly folded up, and its acrid juice pressed out. The leaves are now placed in the same basin, and are constantly agitated with the hands, until completely dry; they are then carefully shaken in bamboo-sieves of various sizes, and prepared according to different methods.

"M. Guillemin has brought with him to France 1,500 feet of Tea-plants, which have been placed in the *Jardin des Plantes*. He thinks that certain parts of France, from their analogy, in climate and soil to the Brazils, are well-fitted for the cultivation of the plant."—*Commercial Gazette.*

EXPIRED PATENTS.

PATENTS THAT HAVE EXPIRED DURING THE WEEK ENDING JUNE 27, 1840.

ENGLAND.

THOMAS HALAHAN, York-street, Dublin, lieutenant in the royal navy, *for machinery or apparatus for working ordnance*, June 22.

SPECIFICATIONS.

A LIST OF SPECIFICATIONS

ENTERED AT THE ENROLLMENT OFFICE, UP TO THE WEEK ENDING JUNE 27, 1840.

(Continued from No. 48.)

ENGLAND.

THOMAS HARDEMAN CLARKE, Birmingham, cabinet-maker, *certain improved fastenings for window-sashes, tables, and such like purposes*, June 24.—In place of the ordinary spring bolt, the inventor adopts the use of a wedge-formed bolt, which is urged backwards in the frame or socket attached to one window-sash, while the hasp or catch reaching from the other sash is held by this wedge-formed bolt. The same improvement may be applied to tables, but the position of the bolts must be varied as circumstances may require.

THOMAS FIRNISTONE, Newcastle, coal-master, *improvements in the manufacture of salt*, June 24.—The first improvement is a mode of evaporating brine in the manufacture of salt. A large shallow brick receiver holds the brine, and the weighted air-tight lid descends to within a few inches of the brine: at one end of the receiver a blast of hot air enters, causing an evaporation, that passes off through a vent at the opposite end.

The second claim is for a mode of constructing salt-pans, and arranging the scrapers for the purpose of drawing the salt therefrom. The salt-pan being round, with a flat bottom and surface, a vertical shaft is placed in the centre, with a frame reaching across the pan; within this frame are placed scrapers, which rise and fall freely in grooves, or are steadied by guide chains. A pocket or recess is formed at one part of the pan, wherein the salt may enter as it is produced by the scrapers, and the rapid rotary movement of the shaft with its frame.

The third claim relates to a mode of evaporating brine in open pans or vessels, by causing the brine to circulate in such manner as to flow over the heated portion of the pan, and thence into other parts of the pan or vessel in connection therewith, where the crystals of salt are deposited as they are formed.

The evaporating pan, heated by fuel, is placed between two shallow reservoirs, which are connected together at one end by a narrow channel; as the brine passes from one reservoir over the heated pan, it is evaporated, and the passage to the other reservoir being provided with a revolving paddle, the crystal salt is collected, and becomes perfectly drained of all humidity.

ALEXANDER MAC RAE, London Coffee-house, Ludgate-hill, *improvements in machinery for ploughing, harrowing, and other agricultural purposes, to be worked by steam or other power*, June 24.—This improvement is applicable in flat countries, and more particularly in the colony of British Guiana, where the cultivated lands are perfectly flat, or nearly so, and the fields are divided from each other by navigable canals running parallel, and at a distance of 240 to 360 feet apart.

The steam engine is placed in a punt or craft, working in the canal on one side of the field, while a windlass, with a drum, is placed in another punt, or craft, floating in the canal, on the opposite side of the field. A chain passes from the engine to the plough, or other agricultural implement, and on to the windlass; hence, when the engine is at work, the plough traverses the field to and fro, while the punts or crafts are moved on at parallel distances.

ENTERED AT THE PETTY BAG OFFICE, UP TO THE WEEK ENDING JUNE 27, 1840.

(Continued from Vol. II. *p.* 292.)

ENGLAND.

LAURENCE WOOD FLETCHER, Charlton-upon-Medlock, Manchester, machinist, *an improvement or improvements in the manufacture of woollen and other cloths or fabrics, and in the application of such cloths or fabrics to various useful purposes*, June 23.—The principal object of this invention is to place the warp and weft threads diagonally, thus giving greater elasticity to the cloth which is suitable for various purposes, such as braces, garters, tubing, bands, &c. The drawings are not sufficient to illustrate the method of working the warp; which, as it forms into cloth, passes round a "temple" or "stretcher" shaped like a wedge.

NOTICE.

In accordance with the determination expressed in our 26th Number, of giving one month's clear notice to Inventors, before pub-

* A metre is equal to about 39⅓ English inches.

lishing their specifications, we hereby inform the following Patentees, that their specification will be published in the "INVENTORS' ADVOCATE," of August 8. Each party will receive, in addition, a *private* communication to the same effect.

Thomas Aithen, of Chadderton, Lancaster, manufacturer, due July 28.
James and Francis Smith, of Spital Works, near Chesterfield, lace manufacturers, due July 28.
William Pontifex, of Shoe-lane, London, coppersmith, due July 28.
Henry Curzon, of the Borough of Kidderminster, machinist, due July 28.
John Whitehouse, of West Bromwich, Stafford, iron master, due July 28.
William M. Forman, of Sheepshead, Leicester, framesmith, due July 28.
Moses Poole, of Lincoln's Inn, due July 30.
William Brockedon, of Queen's-square, Middlesex, due July 31.
Phillippe Marie Moindron, of Bedford-place, Russell square, merchant, due July 31.
William Cubitt, Gray's Inn-road, builder, due July 31.

FOREIGN CORRESPONDENCE.

FRANCE.

THE COMMERCE OF FRANCE IN 1839.

The Administration of Customs has just published a statement of the amount of the trade of France with her colonies, and with foreign countries, in 1839, compared with that of 1838 and 1837. The following are results as regards the general and special trade, in round numbers, expressing millions of francs.

		1839.	1838.	1837.
General Trade	Imports	947	937	808
	Exports	1,003	955	758
		1,950	1,892	1,566
Special Trade	Imports	650	657	567
	Exports	677	658	514
		1,327	1,315	1,083

It appears from this table, that the increase in the general trade over that of the year 1837 is 139 millions of imports, and 245 millions of exports; and the increase over that of 1838 is only 10 millions of imports, and 48 millions of exports.

In the special trade, the total increase of 1838 over 1837 amounts to 232 millions; and the increase of 1839 above that of 1838, taking the imports and exports together, only amounts to 12 millions.

PARIS AND ROUEN RAILROAD.

The *Debats* says:—

"The Council of State have essentially modified two articles, to which the founders of the company attached the greatest importance. By one of them, the liability of the first subscribers, in the event of the persons to whom the shares might have been transferred not paying up their instalments, was limited to the first three-tenths, the proportion fixed in England. By the other, an interest of four per cent. was to be paid to the shareholders during the execution of the works. The Government, in treating with the company, had agreed to these clauses. The Council of State, however, require that the guarantee of the first subscribers shall be to the amount of one-half, or five-tenths, instead of three; and as to the payment of interest, they positively forbid it until after the completion of the works. Theoretically and abstractedly considered, good reasons may be assigned in favor of the system which has been adopted by the Council of State; but if the realisation of practical good had been considered, very powerful arguments might have been adduced against the reasoning of theory. The great capitalists will hesitate to assume the responsibility for future shareholders to the amoun of half the capital, and small capitalists will not consent to allow their money to lie without interest for several years. Thus, supposing the decision of the Council of State to be perfectly reasonable in theory, which we do not dispute, it errs by raising an almost insurmountable obstacle to the execution of the railway by private enterprise. The decision of the Council of State appears to have been dictated by an honorable desire to cut short the facility of jobbing; but this is impossible. So long as there shall be exchanges and negotiations of property, so long will there be speculation, and from speculation to jobbing is but a step. To restrain jobbing efficaciously, we can expect nothing unless it be from the severity of public morality, the rigorous application of the laws against those who abuse confidence, and the progress of intellect, which will put men upon their guard against the snares laid for credulity. Beyond this, all efforts will be superfluous, and will have no other result than to fetter legitimate enterprise."

The *Courrier Francais* takes nearly the same view as the *Débats*, and regrets the decision of the Council, particularly as it will afford to shareholders who paid their tenth of the capital on subscribing, a pretext to withdraw, and thus destroy the constitution of the company. This journal contrasts the encouragement given to railway enterprise in England with the obstacles thrown in its way here, by stating that in England, when one-tenth of the capital has been paid up previously to the passing of the bill, the holders, and the holders only, of shares, are liable for the other calls. This is not the common law of joint-stock companies in England, where, on the contrary, the first subscribers in all companies which are not constituted by special act of Parliament are not only liable for all the calls, although they may no longer be holders of the shares, but are also individually responsible for the debts of the company, as every partner is in a private concern. The latitude given by the Parliament, to which the *Courrier* alludes, is, therefore, a strong proof of the desire to encourage railway enterprise, even at the sacrifice of the established principles of the common law. The *Courrier* terminates its article as follows:—

"Great capitalists, like M. Rothschild, in the St Germain railway, can wait for results; but will small capitalists, who are the most numerous in France, put their money into railways if they cannot receive interest immediately? Are they in a position to be able to do without this revenue during the four or five years that the work may be going on? When the Council of State refuses to authorise the immediate payment of interest on the Paris and Rouen Railway, it is the same as saying to French capitalists, 'Take back the money you have advanced.' The Council of State, in requiring the increased responsibility of the first subscribers, keeps away English capital, and, in rejecting the clause for the payment of interest during the execution of the works, shuts out the small capitalists of France. With such a decision, the railway is impossible. An enterprise which presented the first instance of a real alliance between the capitalists of the two nations, is discouraged and broken off. The road by the valley is defeated like that of the Plateaux. The spirit of association is for ever distroyed in France, unless, indeed, the ministry taking upon itself, as M. Mole did, to resist the aberrations of the Council of State, should authorise what that body attempts to prevent."

The *Siecle* agrees with the views of the *Debats* and *Courrier*, and gives an additional reason for the expression of its regret at the decision of the Council of State. But for the discouragement thus thrown over railway enterprise, as regards the investment of foreign capital in France, enormous sums, says the *Siecle*, might have been expected. Negociations have already been opened with English capitalists for the construction of a railroad from Orleans to Nantes, which this decision is calculated to break off, and all others for similar purposes will be impracticable, if some means of remedy be not found.

The *Siecle* says in conclusion:—

"Rash exactions must not be permitted to destroy the excellent effect which the laws just passed by the Chamber of Deputies are calculated to produce in ameliorating our means of communication. Precautions, when exaggerated, end in the total inability of execution."

The *Constitutionnel* has nothing on the subject. The *Courrier* and the *Siecle*, as supporters of the ministry, show, to a certain extent, the feeling with which the decision of the Council of State has been received by the Cabinet, but do not afford any means of judging whether it will assume the responsibility of setting the decision of the Council of State aside.

THE FRENCH IN ABYSSINIA.

The *Augsburg Gazette* has the following interesting letter from a Paris correspondent, on the commercial relations of France with Abyssinia:—

"The commercial relations of France with Abyssinia have of late years increased in activity. Combes and Tamisier, two enterprising but rather ignorant St. Simonians, returned thence in 1837, and published their travels in that country. In the following year Lieutenant Lefevre, who had been there with the Abbadics, returned, and was charged with a fresh mission to that country. In 1839, Thomas Abbadie came back from Axum, and brought a letter from the King of Tigré to Louis Philippe, containing propositions for a treaty of commerce. Marshal Soult upon this sent Combes with a small expedition back again to Abyssinia. Abbadie, having provided himself with instruments necessary for making scientific observations, also returned thither towards the close of last year, and the Minister of War, about the same time, sent two field officers to make a map of the country. The Jesuits, on their side, sent missionaries and an apostolic vicar. Lefevre has recently returned, bringing with him four Abyssinians and a treaty of commerce; and the house of Balguire Brothers, of Bordeaux, has christened a ship after the capital of Schoa, and sent it to Zeyla, on the Abyssinian coast, to open a trade there. It is reported that the Pacha of Egypt has taken possession of Zeyla, finding that the customs' receipts of Massoura, which belongs to him, and which has hitherto been the principal harbour for Abyssinia, were diminished by the competition of the above-mentioned port. This intelligence, however, wants confirmation. It would be a misfortune if the fact were so, for the Egyptian commandant of Massoura did little more than raise a transit toll of 30,000 Spanish dollars on the poor commerce of Abyssinia, without being able to keep the caravan roads free in the narrow strip between the sea and the mountains. The same oppression would doubtless be extended to Zeyla, and it would be very desirable that some European power should erect a small establishment there to make it a free port, and then, by means of treaties with the Somalis, keep the communication with the interior open, which might easily be accomplished. The surrounding country is inhabited by Somalis and Gallas, a peaceful but enterprising race, who are subjects of the Sultan of Hurra, a considerable town situate about eight days' journey in the interior of the country. Zeyla is the harbour to which the caravan road from Ankober, in Sohoa, leads. It is the natural emporium for all the productions of South Abyssinia, and those parts of Sudan which are in connexion with Ankober. The caravans bring slaves, excellent coffee, ivory, Abyssinian hides, myrrh, gum arabic, and ostrich feathers, from the interior, and take in exchange cloth, hardwares, cottons, and fire-arms, up the country. The caravan road is occasionally rendered unsafe by the wander-

ing Arab hordes, who occupy a part of the plain between the Cape Guardafui and Massoura; but with the aid of the Sultan of Hurra it would not be difficult to keep them in order, or to compromise with them for a moderate transit duty. Zeyla is a tolerably important town, situate outside the Strait of Babel Mandel, opposite to Aden. The English committed a grave error when they took possession of Aden in not establishing a factory at Zeyla, as Lord Valentia had recommended more than 30 years ago. Mr. Canning sent Mr. Salt to Abyssinia to prepare the way for such an establishment, but it is now probable that the French will have the start. Another and perhaps still more important station is Berbera, to the east of Zeyla, which is as yet little more than an open bay adjoining the plain, but where, on the arrival of the caravans, a temporary city, or rather camp, is formed, containing 20,000 to 30,000 inhabitants, and whither a number of vessels resort from Mocha, Hodeida, and Muscat, laden with the productions of Ethiopia and the country of the Somalis, which they barter for European and Indian manufactures.

The trade has hitherto been exclusively in the hands of Arabian brokers, and is carried on in a most barbarous manner. For instance, guns are sold by the span, each span's length of barrel being paid for with one and a half Spanish dollars. The brokers cut through the muscle which connects the thumb with the forefinger to enable them to span further in measuring. The Somalis are a very civilisable race, as is attested by every one who has visited their land, from the Portuguese Jesuits down to the last British captain; and nothing would be easier than to improve to a high degree their trade and that with Sudan. The great evil of the country is the nomade Arabs, who disquiet the plains; but a few posts occupied up the country to cover the road to Hurra, and give escorts to the caravans, would suffice to keep them in check. The Somalis want nothing but unity to make a nation; their improvement is retarded by their being split into so many little tribes. The fair of Berbera, which lasts from September till April, has of late years been visited by many English vessels, which are always received with great joy by the inhabitants, although the Arabian brokers detest this new competition. Bordeaux will in future divide this trade with Liverpool. But it is absolutely necessary that the English and French Governments should come to an understanding, in order to prevent the traffic in slaves, otherwise every importation of European wares will lead to wars and devastation in the interior of the country; whereas, if slaves were not made an object of barter, the exchange of various productions would become an instrument for the spreading of peaceful industry and civilisation.

BELGIUM.

THE LATE MR. COCKERILL OF SERAING.

A Brussels letter, in mentioning the death of Mr. John Cockerill, says that he arrived at Warsaw from St. Petersburgh on the 10th inst., and was immediately attacked with brain fever. After suffering till the 19th, he died in the arms of his wife. He was in the 48th or 49th year of his age. Mr. Cockerill is said to have made a will, bequeathing the whole of his property to his widow, who was a native of Aix-la-Chapelle, but by whom he had no children. The factory at Seraing is to be sold for the benefit of the creditors; but, after all the debts are paid, it is expected there will be a surplus of between one and two millions of francs.

It is stated that the Belgian government intends to commence on the section of the railroad from Brussels to Tubise, as an experiment, the system of conveying merchandise, to be delivered at the places to which it is directed, under the immediate charge of the government.

PRUSSIA.

THE PRESENT KING OF PRUSSIA.

From the Saale, June 19.—The newspapers have circulated an article of the *Conversations-Lexicon der Gegenwart* on the present King of Prussia, in which Niebuhr is omitted to be enumerated among the men who directed his early studies. Some reference, however, to what Niebuhr himself has said on the Prince's education, cannot but be interesting; nay, his opinions are indeed important, as he was far from being a man addicted to flattery or adulation. The first opinion occurs in one of Niebuhr's letters, dated December 21, 1813, (see *Lebens-Nachrichten ueber B. G. Niebuhr*, vol. i,, p. 576), before he had begun his course of instruction:—"It is always with unspeakable satisfaction I see the Crown Prince. His noble poetic nature is now gradually becoming perceptible to many. He has an incredible depth of feeling, but he guards his peculiarity of character without affectation, and also as a secret when among those who do not understand him, and always misrepresent him. There is something extraordinary about him; the King rouses his inmost soul. We may foretell great things for Prussia and all Germany from him—the completion of all that is yet deficient."

In the winter of 1814, a course of instruction on the subject of finance was commenced, with reference to which Niebuhr on the 2d of December, 1814 (vol. ii., p. 126), writes—"Only two hours a week are allowed, which for the subjects to be handled is in every respect too little time, but this arrangement cannot yet be altered. His attention and the interest he takes, are as earnest as I could wish; a great number of hours for various instruction might well tire him. He inquires and converses much, and in an extremely intelligent and animated style."

In the same month, Niebuhr (ii., 127), again writes—"I have more than once wished to sit down to tell you, (his friend Hensler) what pleasure I receive from the time I spend with the Crown Prince, but business has prevented me. I am glad when the day comes round when I must go to him. He is attentive, inquisitive, highly interesting, and all the noble gifts with which nature has so richly endowed him are unfolded before me during the few hours I am with him. Our occupation is often interrupted by discourse, but never by gossip, and in this there is no loss. The gaiety of his disposition does not detract from the earnestness of his application, and the emotions of his heart are as deep as the sports of his fancy are light. He seeks advice and information without delivering himself up to any authority. I never met with a youth of a finer nature. He knows how much I love him, that I can see in his looks, and he knows too wherefore I love him; he knows that it is not through our external relations that I am attached to him. How it has happened I cannot tell, but a favorite castle in the air which he delights to build is to make himself sovereign of Greece, to fancy himself wandering among the ruins meditating and exploring. He has thus easily revived my old hobbyhorse. 'When we are settled in Athens,' said I to him, 'you must make me professor of Greek history, conservator of the monuments, and director of the excavations.' 'No, no, not conservator; you shall not have that title; I will dig myself, but you shall be with me.'"

In the year 1824, on his return from his mission to Rome, Niebuhr was summoned to attend the deliberations of the Council of State, and on the 18th of May in that year (iii., 76), he writes—"My reception by the Crown Prince was of the warmest kind, and after I had been three hours with him he invited me to come regularly every afternoon and spend some time with him." Further on (iii., 77), he says—"The Crown Prince has cultivated himself in a wonderful manner. His heart is entirely as it was of old, but his mind is enriched by many acquisitions. Prince William, too, is no less cordial and amiable. In short, those who are not satisfied with these princes must make great claims on the ordering of things in this nether world. A friend received by his equal, could not have been more heartily received than I was by both."

Afterwards (iii., 99), on the 13th of December, he writes to his wife—"Yesterday and to-day I passed some hours with the Crown Prince. All his sentiments are noble, praiseworthy, and unaffected. He is just towards all men, even to those for whom he has by no means any personal liking, and indeed, though any one should be noted for liberalism, it does him no prejudice."

Similar opinions respecting "the dear Crown Prince" are expressed in other passages. Niebuhr's affection for the Crown Prince was ardent until the last moments of his life, and numerous demonstrations and honorable distinctions proved the reciprocity of their feelings. They used to walk arm in arm together through the streets of Bonn. At a recent period, when Professor Brandis, then rector of the university, on presenting the professors, spoke of Niebuhr, (deceased on the 2d of January, 1831), the illustrious Prince, who also alluded to the departed philosopher in his reply, could not suppress his tears.—*Leipsic Allgemeine Zeitung.*

STEAM IN THE LEVANT.

Extract from a letter from Constantinople, May 17, 1840:—"A Levant Steam-boat Company would pay prodigiously. The French and Austrians have it all their own way, and are making immense sums. Every one would prefer an English boat. For example, a boat to Trapezund, proceeding to Ridonte Calé, in Georgia, and then returning to Constantinople; a boat to Smyrna from Constantinople; another to Malta, Alexandria, and Salonica and Greece; also out of quarantine to Naples, Civita Vecchia, and a little boat to work between Constantinople, Brussa, the Sea of Marmora generally, would pay well—for the silk-trade and passengers. A boat from Constantinople to the Danube, also to Odessa, in short, to many good places. The Austrians are slow and not liberal, and manage the thing ill; the French worse. The Austrians have the monopoly, and might soon be out-run by a sharply-administered company. I think so well of the undertaking that, were I a man of property, I would largely embark in it. The rates are unreasonably high, and so many persons go and so few boats to carry them, that if one is damaged the line is interrupted. There is a beautiful Scotch steamer to be bought here, which was damaged in the Black Sea, for £8,000. She cost £28,000 about three years ago, and with an outlay of £2,000 might be made as good as new. The English and Scotch capitalists ought to be ashamed of allowing the Austrians and French to have a monopoly."

AFFAIRS OF THE EAST.

Beyrout, May 29.—Mont-Liban, the Druses, the Maronites, and the Naplousians are in a state of insurrection. A convoy, which was destined for Alep, has fallen into the power of the insurgents. Some soldiers have been killed in defending it. This convoy was conveying ammunition. The Governor of Beyrout is having all the forts armed, and the garrison is kept within doors. An attack is feared. All the roads are intercepted in the interior. The insurrection was brought on thus:—Ibrahim Pacha demanded of the Emir Beehir that the mountaineers should be disarmed. The latter refused to comply, as well as the Druses; they stated that the government ought to have confided in them, since it was to them that it owed the repression of the insurrection of Hauran. They affirmed that they were only to be disarmed that

fresh levies might be made amongst them; and they stontly declared that they would rise up with all the adjoining populations rather than give up their arms. This has actually taken place.

Yesterday evening, at nine o'clock, the Governor of Beyrout had a meeting of every person of distinction; news had been received that a descent of the mountaineers was going to take place for the purpose of disarming the troops which formed the boundary line required on account of the plague, which was raging at Damascus, and the resolution was immediately taken to suppress the same, and send back the troops that composed it to the town, inasmuch as, being very few in number, there was too much risk to run. Last night and this morning we saw them enter. The plague has therefore no obstacle to encounter. At Seïda, Soliman Pacha had a meeting of all his people last night, and the result of the deliberation was to send all the troops to be encamped round Seïda. Convoys of powder have been stopped and seized by the mountaineers, and some persons (eight) have been assassinated in offering resistance. The affair took place near a village called El Haddet. At another place two Egyptian officers were taken, but one of them managed to escape, being still near Seïda.

LIVERPOOL, HALIFAX, AND BOSTON ROYAL MAIL STEAM-SHIPS.

The *Britannia*, the first in order of the line of steamers appointed by the Admiralty, to ply between this port and Halifax, proceeding on to Boston, arrived here on Friday last, after a fine passage of seventeen hours from Glasgow, and is now lying in the Coburg Dock. She is preparing for sea with all despatch, as she is to take her departure on Saturday next. She is a fine, compact, roomy, and beautifully-modelled vessel, and gives every indication that she will prove one of the best ocean-going steamers afloat. Her interior accommodations for passengers are arranged on a new plan, whereby the sleeping apartments and the saloon, or drawing-room, are kept entirely separate; the former being disposed so as to ensure snugness and comfort, and the latter abundant light and ventilation. The saloon is built on the after-part of the main deck, to which it opens through a wide passage which communicates with the steward's bar. Thus the deck, on each side, forms a spacious and airy promenade, from which the passengers can, in a moment, retreat to an elegantly furnished apartment. The saloon is fitted in the gothic taste, the panels and ceiling being elaborately carved and painted to represent oak. The door of the steward's bar is immediately opposite the door of the saloon, so that every refreshment and luxury that may be required will be at hand, and can be supplied in a minute. The wine-cellar and spirit-room are directly below the bar, and their stores are so ranged as to occupy the smallest possible space, while they are instantly obtainable by those above. The spirits, in fact, are pumped up by an engine, while the bottles are packed in compartments, where they are secured without the aid of straw, so that all risk of fire is avoided. Altogether, this bar is one of the most convenient places we have ever inspected. Every thing that can be wanted is at hand, while nothing is crowded, all is order, neatness, and elegance. Proper receptacles and compartments are provided for the silver plate, knives, forks, spoons, glasses, dishes, and all essentials, required for a banquet. Beneath the main deck is another handsome room, which leads abaft to two suites of excellent sleeping apartments, the berths in which are roomy and convenient. The mode of lighting the passages and sleeping rooms, is unique. At the junction of each pair of chambers is fixed a triangular lamp, which throws light from each of its three faces into the rooms on the right and left and into the passage. As a security against the incautious use of fire, no person can open these lamps but the individual who has charge of them. The sleeping-rooms which we have described, are appropriated to the gentlemen. Opposite to those, towards the middle of the vessel, is the exclusive apartment of the ladies. From this the berths of the latter open, so that they have the advantage of a general room to themselves, communicating with their bed-chambers. Beneath these are the wine-cellars, the spirit-room, the luggage room, and the room set apart for the reception of the mail-bags, which will be under the charge of an officer especially appointed, who will have all the despatches committed to his entire custody. Thirty-two roomy and convenient berths are fitted up in the fore-part of the vessel, making, with the chief cabin berths, accommodation for one hundred and thirty-two persons. Still further forward, are the officers' mess-room and the servants's sleeping-room; and, in front of these again, are the accommodations for the seamen, &c. The available space has been every where ingeniously economised, while the nicety of every arrangement keeps aloof that sense of closeness and restraint frequently experienced in passenger vessels. Every apartment and avenue is lofty, airy, and agreeable; the fittings, without being gaudy, are neat and elegant, the great study having been to secure as much as possible of that great essential—comfort.—*Liverpool Albion.*

RAILWAY INTELLIGENCE,

DOMESTIC AND FOREIGN.

The Blackwall Railway will be formally opened by the Directors to day, and to the public on Monday. On Wednesday an experimental trip was made by the Directors, when the machinery gave great satisfaction; and the trip down and up was performed in 7½ minutes each way, or at the rate of nearly 30 miles an hour.

The London and Croydon Railway.—*To the Editor of the Railway Magazine.*—Sir—When Parliament granted the bill to the London and Croydon Railway for making a railroad, it cannot but be supposed that they intended it for the convenience of the public, and not a nuisance, and that it should accommodate the public, and not incommode them. The Company got the bill, made the railroad, take the money of the public, but as for accommodating them, that is quite another thing. It is now more than a year since the line has been opened, and a great traffic it has had, and money has been received and money has been spent, but no stations have been built, either at Sydenham or Annerley. They had at last, wearied out, I suppose, by the continual complaints of the inhabitants, *begun* one at Sydenham, but there appears not a shadow of one at Annerley, nor does there seem any intention on the part of the Directors to build one, although this station is *one* of the best, and I have heard, *is* the best upon the line; such neglect on the part of the Directors, the interests of the Company, and the comfort of the public, is exceedingly disgraceful, and calls loudly for some notice from the shareholders, who have entrusted the concerns of the Company in the hands of men so reckless of what they do. Why they have *not* made any preparation for building a station at Annerley, as well as at Sydenham, there must be some reason for—something behind the scene, which the public are not aware of; it will be my endeavor, Sir, to find it out, and as soon as I do, you shall know. I was in hopes that the *rather strong hint* that the late Directors received, that the *Proprietors* wished the public to be fairly dealt with, would have had some influence upon these gentlemen—it may have—but we have not seen the proof at Annerley. You have Sir, of course, heard of their determination to raise the prices. This has given to the public who frequent their line, great and general dissatisfaction; for they feel it to be, what it is, an imposition upon them—a perfect trick. After having ran off the coaches, they raise the prices, and do just as they please with us: if ever Directors wanted a little parliamentary influence exercised over them, it is these. I do hope, Sir, that the Proprietors will look to their interests, and again shew that THEY wish the public to be fairly dealt with. In a future letter, should it seem agreeable to you, Sir, I shall enter more into detail on various circumstances, for I am quite sure that the Proprietors are not aware of many things that are going on. —I beg to remain, Sir, your obedient servant,
Norwood, June 23, 1840. Scrutator.

Opening of the Birmingham and Gloucester Railway from Cheltenham to Broomsgrove.—This important line of railway was opened for general traffic on Wednesday, the 24th ult. The distance was accomplished in three hours and ten minutes. The prospects of the company are said to be good.—*Bristol Standard.*

Opening of the Hull and Selby Railway.—This railway was opened on Wednesday last, July 1st, on which occasion tho principal tradesmen determined on shutting up their shops and places of business, so as to give the different parties in their employ an opportunity of witnessing the opening of this important undertaking.—*Hull Observer.*

Opening of the Lancaster and Preston Junction Railway.—On Saturday, the above railway, which joins the North Union line at Preston, and thus forms a continuous line of railway from London to the county town, was opened to the public for the conveyance of passengers, &c.

London and Birmingham Railway.—Another Fire!—About nine o'clock on Monday morning, the passengers in the first or open carriage of the up-train of the London and Birmingham Railway, when about seven or eight miles distant from Ambergate, Nottinghamshire, were greatly alarmed by a strong smell of fire, which they at first imagined proceeded from some of the wheels of the carriages having ignited, from the rapidity at which the train was at the time proceeding, accidents of that nature having on former occasions occurred from that cause. It was found to proceed from one of Pickford's wagons, which was so much burnt that it was rendered wholly useless, and its contents, which consisted of woollen cloths, about 300 ready-made waistcoats, and an immense quantity of other valuable property, were almost entirely consumed. The fire is supposed to have originated from some sparks which proceeded from the funnel of the tender, having fallen upon the tarpauling which covered the wagon. It is impossible to give an estimate of the value of the property destroyed.

South-Eastern Railway.—We stated last week, that much activity prevailed at the works of this railway in the vicinity of Dover; and we learn that at Penshurst and Leigh, in the neighborhood of Tunbridge, they are also rapidly progressing. The whole of the forfeited shares have, we understand, passed into the hands of holders of the highest respectability, and the prosperity of the company is shown by their recent advance in the market; while the recommendation by the Admiralty Commission, of Dover Bay, as a harbour of refuge, will give additional stability to the undertaking.—*Kent Herald.*

Great Western Railway.—During the present month, it is expected that the railway will be extended to the Faringdon-road, and in the month of August the trains will reach the Swindon station, a distance of 76 miles from Paddington, and leaving only 30 miles to complete the line. The traffic appears to be on the increase weekly, and the continued rapid advance in the shares proves the great estimation in which this line is now held. The business doing at the Reading station, it appears, has not been diminished to any great extent by the extension of the line to Steventon, the receipts for the week ending June 6, amounting to nearly £900. —*Reading Mercury.*

Eastern Counties' Railway.—On Wednesday last, July 1st, there was a further extension of railway communication from the metropolis, the Eastern Counties' Company having extended their terminus westward from Globe-fields to Shoreditch, and eastward to Brentwood, the whole distance being about

nine miles; while the North Midland and Midland Counties Railways were opened, by which a junction was formed between Hull and the metropolis, which is connected by means of the London and Birmingham Railway.

Railways between York and London.—These stupendous works were opened all through on Tuesday. The journey from York to London can now be performed in less than ten hours! The directors of our York and North Midland Railway inspected the whole line to Altofts a few days previously, and were highly gratified with the order and arrangements. The distance from York to London by railway is 217 miles.—*Yorkshireman.*

Railway Speed.—At the conclusion of the fete to celebrate the opening of the South-Western Railway, the Chaplin engine, with one carriage, containing Mr. Locke (the engineer), Mr. Reed (the secretary), Sir Hesketh Fleetwood and two friends, and Dr. W. Lebb, was despatched from Southampton at a quarter to eight o'clock, stopped at Basingstoke eight minutes, at Woking six minutes, and arrived at the Nine Elms terminus at four minutes past 10, performing the whole journey of 76 miles in the short space of two hours and five minutes.—*Railway Times.*

The Engines on the Birmingham and Gloucester Railway.—We understand that an experiment was made on Friday last, with the new engine supplied by Messrs. Norris and Co., of Philadelphia, on the inclined plane at the Lickey Hill, a load of 60 tons being attached. The result surpassed all expectations, the rate of speed attained exceeding twelve miles per hour, notwithstanding the disadvantage of the engine being obliged to start at near the middle of the hill, owing to the base not being yet completed. From the result of this experiment, there appears to be no doubt that when the impetus is obtained before the inclination begins, and when the steam is up, a speed of from eighteen to twenty miles, with a load of from 50 to 60 tons, may be attained. The inclination is, we believe, 1 in 35.—*Midland Counties' Herald.*

Leamington Railway.—We are much gratified to learn, that every reasonable prospect exists of the projected line of railroad between this town and the station of the Birmingham and London Railway at Coventry, being accomplished without any influential opposition, and that public opinion is at length generally favorable, among all classes, to an undertaking, the benefits of which cannot be otherwise than extensively important to Leamington and the surrounding neighborhood. The subjoined form of recommendation with regard to the proposed measure, has lately received the signatures of the Earl of Warwick, the Marquis of Donegal, Lord Teynham, Lord A. Chicester, Dr. Jephson, Captain Musgrave, Mr. Sanderson, Mr. Hunter, &c., and of many other noblemen and gentlemen, who feel an interest in promoting the welfare and prosperity of this town and its environs:—"Proposed Extension of the London and Birmingham Railway to Warwick and Leamington.—We, the undersigned, view with satisfaction that measures are in progress for obtaining an extension (*via* Coventry) of the London and Birmingham Railway, which will render to the towns and neighborhood of Warwick and Leamington Priors the full and entire benefit of that most desirable mode of communication."—*Railway Times.*

Chester and Holyhead Railway.—In the House of Commons, Lord R. Grosvenor, after describing the two plans of railway communication brought before Parliament, to connect London and Dublin, observed that the government engineers to whom the matter had been referred, reported in favor of the Chester and Holyhead line, but unfortunately the report was not laid on the table till the end of April, and if the house did not accede to his motion, the promoters of the bill would not be able to give the proper notices till next year. The proposed railway, when completed, would effect a saving of £70,000 a year to the country. His lordship concluded by moving—"That the promoters of the proposed railway from Chester to Holyhead be allowed to bring in a bill in the next session of parliament for carrying the same into effect, on giving notices and depositing plans and sections, as required by the standing orders relating to other bills of the second class, except railways; and that the standing order, requiring a portion of the capital to be deposited in the Exchequer prior to the application to Parliament, be dispensed with."—Mr. G. Wilbraham seconded the motion.—After a debate of considerable length, a division took place, the numbers being—for the motion, 110; against it, 120. The resolution for dispensing with the standing order was consequently lost.

Railway Speed.—The first trip made by the new locomotive engine of Messrs. Laird, Kitson, and Co., with passengers on the North Midland Railway, proved the power and speed of the engine. It travelled on Friday week from Rotherham to Derby, taking a very heavy train of passengers—the latter part of the distance no less than five hundred—most of them were going to Derby fair; and the journey, which is upwards of 39 miles, was performed in an hour and twenty-five minutes. In returning, the engine with only the tender attached, ran *ten miles in eight minutes*, between Belper and Clay Cross tunnel, being at the rate of *seventy-five miles per hour!*—*Doncaster Gazette.*

Stockton and Darlington Railway.—Another Fire!—On Wednesday morning, the goods-train on the Stockton and Darlington Railway took fire between Middlesbrough and the former place, by which five wagon-loads of goods, part of which had been just landed from the London steam-packet, were destroyed or greatly damaged. The wagons, we are informed, were private property, and being unprotected with the regular tarpauling, always used by the company, it is supposed the fire was caused by a spark from the engine falling upon some flax, which formed part of the goods destroyed. The loss is estimated at between two and three thousand pounds.—*Durham Chronicle.*

The Railway Commission.—The handsome terms in which Sir Robert Peel, in the course of the debate on the Chester and Holyhead Railway, spoke of the report of the Government commissioners (Colonel Sir F. Smith and Professor Barlow), does great credit to his candor and impartiality. "He had read," said the Honorable Baronet, "the report, and after having done so, he never felt more confirmed in his opinion of the policy of the government appointing commissioners. A more able or more conclusive report he had never read. It brought conviction home to his mind that the shortest line of communication was by Holyhead." It is gratifying to us, to find the opinion which we had ourselves previously expressed of this report confirmed by so high and competent an authority. If the government are only equally happy in their choice of persons for the executive of the proposed board of railway superintendence, the railway interest will have nothing to fear, and the public at large everything to hope.—*Railway Times.*

Railways.—Passenger Tickets.—A correspondent has made a suggestion to us, which we hope will receive attention. The plan is extensively adopted in America. A brass ticket is given to every passenger for every box or packet of luggage, a duplicate of which is fastened to such luggage. At the station, the passengers produce these tickets, and receive in exchange their own property. The want of some such arrangement has caused much trouble, and some loss, on several railways in this country.—*Eastern Counties Herald.*

The Revenue from Railways.—To the Editor of the Sun.—Sir,—In your paper of this evening, I observe the publication of a document on the above subject, purporting to have been drawn up by Mr. Hyde Clarke, in which, with all deference to that gentleman, there appears some very egregious, and, I may add, inexcusable errors—inexcusable, inasmuch as that those who volunteer to instruct the public on such subjects should, at least, inform themselves respecting their real position—for otherwise, so far from being serviceable, their advocacy becomes mischievous. The income of the London and Birmingham line, in the document alluded to, is put down at £600,000 per annum. Now, the exact amount received for the twenty five weeks of the present year, which has already elapsed, is £329,000, which is at the rate of nearly £700,000 per annum. Again, the income of the Grand Junction line is stated at £300,000 per annum. The sum received on this line for the same period is £195,000, or upwards of £400,000 per annum. The income of the Leeds and Selby line is put down at £15,000 per annum. In 1839, the income of the line was £41,762, and there has certainly been no falling off in the traffic during the present year.

So much for the errors respecting the revenue of the railways. In respect to the expenditure, Mr. Clarke is an equally unsafe guide to follow: he puts down the expenditure at sixty per cent. on the income. Now the slightest inquiry will show him that the average expenditure is less than fifty per cent. It is unnecessary to take up your space by refuting the assertion he makes, that various counties, such as Cumberland, York, Gloucester, and Devonshire contribute nothing towards the income of the different lines now open, but I would be glad to know, in common with, I dare say, many more of your readers interested in this subject, how Mr. Clarke can make it evident that, but for the extortion of the landowners, and the adverse feeling of agriculturists generally, the income from railways would be five millions instead of two and a half millions as at present. Extortion may increase the cost of making the different lines, and, consequently, diminishes the profits of the shareholders, but it certainly has no bearing on the revenue derived from the lines themselves.—*Your's, A Friend to Railways, and an Advocate for their position being accurately stated.*

June 29.

Paris and Orleans.—The works of the Paris and Orleans Railroad, between the capital and Corbeil, have just met with a most serious and unexpected check. At Ablon the line is cut through a hill, and the rails were on the point of being laid. A subsidence of soil had taken place a few months since, but bridges serving as buttresses had been erected, and all the danger of a further slip was supposed to be obviated. On Friday last, however, the land on the hill-side above the cutting gave way for a great extent, and came down with overwhelming force, filling up the cutting for nearly 200 yards in length. The earth in some places has completely rolled over; large gaps or ravines have been made in the hill, and trees have been brought down by the soil 200 and 300 feet from the places where they grew. It is not yet decided what means will be adopted to surmount the new obstacle to the completion of the line. It is probable that a double tunnel will be constructed. The road was to have been opened by the end of July, but this accident will cause a delay of three or four months. Any person wishing to witness the effects of an earthquake in miniature, will not regret making an excursion to Ablon.

Magdeburg and Leipsic Railway.—The first section of the railroad from Magdeburg to Leipsic is entirely finished.

Accident on the Liege Railway.—One of the guards on the Liege railway was killed on the 23d ult., in consequence of being struck by the engine, as he was hastening to close one of the barriers. Since the opening of the first Belgian railroad, on the 5th of May, 1835, up to the 23d of June last, there have been 7,780,000 passengers carried backwards and forwards; and of this great number only six have been killed, and their deaths were caused by their own imprudence. Most of the fatal accidents have been confined to persons connected with the management of the railroads.

Railways in France.—The Railways in France, which latterly have occupied so much the attention of the Legislature, have caused a great deal of dis-

cussion in the French journals. The proposal of M. Emile Pereire, who was examined by the commissioners on the line from Paris to Rouen, of using the line for other roads, has met with many objections. It is thought, that the uniting in one point a great number of lines, and thus bringing them all under one power, would be creating a monopoly. As M. Pereire supported his views by a reference to the English roads, and especially the one from Liverpool to Manchester, which is connected with six important branches, he is asked why, when resting so much on English authority, he did not extend his researches farther, but overlooked the Parliamentary inquiry into the possibility of connecting a number of railroads in great cities, when he would have found that practical men were not only opposed to new junctions, but also insisted on the advantages of separating roads already united? The report of the English commissioners on the subject, is considered so important, that the journals promise an analysis for the instruction of the committee, who seem favorable to the views of M. Pereire. Another point of discussion is the manner in which a Government (assuming that it ought to assist the railroads) would most efficaciously afford its aid. The first method is that of loan, the advantage of which is that the Government runs no risk, as it can always require security superior to the sum advanced; but it is thought that there are a multiplicity of cases for which assistance of this sort would be insufficient. The next is, when the state takes shares; but the dependence that would naturally result from such a combination is regarded as embarrassing to the shareholders. To avoid such a difficulty, it is proposed that Government should give the other shareholders a preference in receiving their interest, and a large proportion of the dividends. This, however, is considered as too disadvantageous to the state, which would have to endure all the evil of non-success if the project failed, and at the same time receive but a moderate share of the profits in the event of success, to say nothing of the circumstance that such an arrangement would not ensure the completion of the works, as these might stop after the state had paid up its capital. A third method would be for the state to guarantee to the shareholders a moderate interest on their shares, on condition that the works should be completed. This would have the advantage for the state, that its expenses would be spread over a great number of years, and thus be calculated to meet the receipts of the revenue. The interest guaranteed must be sufficiently high to induce the shareholder to be contented with a risk as far as concerned his further profits, and at the same time not so high as to counteract his exertions for more. The two plans of loan and guarantee are those which the commissioners have preferred, and the adoption of which they recommend—the first for the road from Roanne to Andregieux, the second for the road from Paris to Orleans.—*Times.*

Departure of the British Queen Steam-ship.—This magnificent and powerful steam-ship, under the command of Lieutenant Roberts, R.N., is again on her voyage to the western world. She left her moorings off the Brunswick Steam-packet Wharf, Blackwall, shortly after noon on Monday, and proceeded in gallant style down the river. She carries out a great number of passengers, nearly all her berths having been engaged, and a very valuable cargo. She also takes out to New York, an immense quantity of letters and newspapers. A great crowd of persons assembled at Blackwall to witness her departure.

New Steam Ship.—New York.—A steam ship is building at New York for the Emperor of Russia, and is almost finished. Its size is nearly equal that of the *Great Western.*

IMPORTANT METROPOLITAN IMPROVEMENTS.

The select committee closed its sittings on Wednesday last, and presented its report on the following day. A bill founded on that report is to be brought in forthwith, and will provide for the following improvements, viz:—For opening a thoroughfare from the end of Coventry-street to the junction of Newport-street and Long-acre; for continuing the line of street from Waterloo-bridge (already completed to Baw street) into Broad-street, Holborn; for extending Oxford-street in a direct line through St. Giles's, so as to communicate with Holborn, at or near Southampton-street; and for opening a thoroughfare between the populous neighbourhood of Whitechapel and Spitalfields, and the docks and wharfs of the river, by a new street commencing at Spitalfields church.

GRATUITOUS COPIES

of our Journal have been forwarded to a number of Individuals interested in some Patent, or Invention, of which notice has been taken in our number of to-day.

TO CORRESPONDENTS.

We shall, at all times, be ready to ANSWER QUESTIONS *that may be put to us, relative to any of the subjects indicated in our title; and questions put during the current week, will be replied to either the same, or following week.*

"The Inventors' Advocate, *and* Journal of Industry," *may be forwarded,* postage-free, *to all the undermentioned places:—*

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It will be transmitted, upon payment of one penny, *to India, the Cape of Good Hope, and New South Wales.*

To all other places, it can be forwarded on payment of two-pence.

"The Inventors' Advocate" *is published every* Saturday Morning, *at* 7 o'Clock; *if, therefore, our Subscribers do not receive their copies* regularly *from their Newsmen, the fault never rests with* us.

For the convenience of persons residing in remote places, *the* "Inventors' Advocate," *will be regularly issued in* Monthly Parts, *stitched in a handsome wrapper.* Parts 1 *to* 12, are now Ready.

Advertisements *should be sent in not later than* Thursday Evening.

"A Regular Subscriber" *is informed, that the patentee in question has* not *enrolled his specification.*

"A. Z."—*Will our Correspondent favor us with his name and address?—of, course, confidentially. We cannot reply to his questions in the columns of our Journal, so well as by letter.*

"E. G——t," Bristol.—*The circumstance you allude to, if unsupported by other evidence, would* not *be an infringement.*

"W. Jemmett."—*In this matter, we must refer you to your solicitor. It is a point of law, on which he will be able to advise you how to proceed safely.*

"A. P——y."—*We thank our Correspondent for his favor; but do not consider it suited to our columns. It is too "inventive" for us, and treats of a subject on which we would rather not offer an opinion. These matters had far better not be meddled with. At the best, they are founded on mere surmise, and can do nobody any good.*

TO OUR SUBSCRIBERS.

Two *numbers of the* "Inventors' Advocate" *(Nos.* 48 *and* 49*) are published this day. The former contains, in addition to the usual varied matter, the* Title Page *and a* Copious Index *to the* Second Volume.

Volume II. *of the* "Inventors' Advocate," *handsomely bound, is* Just Ready. *A* Few Copies *of the* First Volume *still remain on hand.*

TO INVENTORS.

ALL PERSONS who may be desirous of TAKING OUT PATENTS, or of bringing VALUABLE INVENTIONS into USE, are requested to APPLY to the PROPRIETORS of "THE INVENTORS' ADVOCATE," (DELIANSON CLARK & CO.) at their "PATENT AGENCY OFFICE FOR ALL COUNTRIES," 39, CHANCERY LANE, where they may be consulted, daily, relative to the PATENT LAWS of GREAT BRITAIN, and ALL OTHER STATES.—(See ADVERTISEMENT on the last page of the present Number.)

THE

INVENTORS' ADVOCATE,

AND

JOURNAL OF INDUSTRY.

SATURDAY, JULY 4, 1840.

The question of the Sugar Duties, which was agitated last week in the House of Commons, presents a striking instance of the complicated relations of this country with its colonies and with foreign powers, which make it difficult to take a single step in advance towards free trade, without being involved in innumerable difficulties. The simple proposition to be considered is this:—as the supply of sugar from our West Indian colonies is not at present sufficient for the demand of this country, whether it would not be adviseable to supply the deficiency by admitting foreign sugar into the market, on payment of a reasonable duty. This proposition is founded on sound sense, and equitable principles; and the objections urged against it by the friends of the planters, on the ground that such a measure would be injurious to their interests, have no foundation in reason, justice, or fair dealing.

The cause of the deficient supply, is admitted to be owing to the scarcity of labor in the West Indies, in consequence of the unwillingness of the negroes to endure, without compulsion, the fatigue of cultivating sugar; and the case the planters want to establish is, that it would be a hardship and an act of injustice to deprive them of the means of cultivating

their plantations by emancipating the slaves, and then to make the consequent limited supply the pretext for abolishing the monopoly they have hitherto enjoyed. They seem, however, in this statement of their case, entirely to overlook the fact that they have received twenty millions sterling from this country, as a compensation for the injury they might sustain from the measure of negro emancipation; and, were their interests alone affected in the consideration of the question, it might soon be disposed of without any injustice to the colonists, and with decided advantage to the mother country. But another question arises, the difficulties of which appear to be insurmountable in the existing state of our relations with some of the foreign sugar-producing countries. England has bound herself by treaty, to admit the produce of the Brazils and the United States, on as favorable terms as that of any other nation. We are not in a condition, therefore, to impose a higher duty on the sugar produced by slave labor in those countries, than on the sugar cultivated by free labor in other parts of the globe; whilst to admit the produce of slave labor into competition with that of our emancipated colonies, would be to offer a premium for slavery, and to discourage the system of free labor we have made so liberal a sacrifice to establish.

It appears to us, indeed, that this difficulty ought to have been foreseen, and provided against, at the time the measure of slave emancipation was taken into consideration; and that the then existing commercial treaties with countries that continued a system of slavery, ought to have been remodelled, in accordance with the great principle of freedom that was then introduced throughout the British colonies. We are not, however, now free agents in the matter, and we must either be content to pay an exorbitant price for the sugar cultivated by free labor in the West Indies, or to render our efforts on behalf of the enslaved negroes abortive.

There is, indeed, another consideration of this subject, involving the system of colonisation, which might lead us to protect the interests of our West Indian colonies even at the sacrifice of paying nearly double for their produce. It is a question, however, into which we shall not at present enter. It embraces a comprehensive field of inquiry, and requires a careful examination of the relative positions of the mother country with her colonies and with foreign nations. We may, however, observe, that viewing it as an abstract commercial question, apart from political considerations, the value of colonies diminishes in proportion to the increase of mechanical skill and manufacturing industry of the mother country. As the principal advantage of possessing colonies depends on their affording exclusive markets for home produce and manufactures, when the latter have advanced to such perfection as to challenge competition with any other manufacturing state, no exclusive privileges are required, but, on the contrary, the utmost extension of the principles of free trade.

THE CAPABILITIES OF STEAM SHIPS FOR STEERING WITHOUT A RUDDER.

A long time frequently intervenes between the introduction of any new and important improvement in machinery, and the adoption of the means suitable for deriving all the advantages from the change which it effects in established usages. We are so wedded to old habits and customs, that when any innovation is made in them we still cling to the former modes of proceeding, and seem determined to limit the alteration to the narrowest possible bounds, and to clog the operation of the new invention by a cumbrous, antiquated machinery, not adapted to the development of its powers. When any new discovery is applied to old machinery and former modes of action, we ought carefully to consider whether the means that were, before, well adapted to produce certain effects, are equally suitable to the new modes of operation. Applying this principle, therefore, to steam navigation, let us consider whether the means adapted for guiding sailing ships be the best method for guiding vessels that are propelled by a power which is, in its nature and action, altogether different.

In the present method of steering, it is well known that vessels are guided by means of a rudder placed at the stern. The action of the rudder depends upon its presenting a resistance to the water; and, the greater the resistance, the greater is its power in turning the ship round. The action of a rudder on a ship, is, in fact, similar in principle to that of horses drawing a carriage. If one horse holds back, or does not go so fast as the other, that side which moves the fastest has a tendency to turn round; and, if this unequal motion were continued, the carriage would describe a circle. It is the same with a ship, when the rudder is placed obliquely. The side which meets with the least resistance moves the fastest, and has a tendency to turn and describe a circle round a centre towards which the rudder points.

In proportion to the effect of this resistance of the water to the rudder, in turning round the ship, is its retarding influence on the motion. Suppose, for instance, that two rudders were placed at the stern of a ship, and that each of them was inclined at the same angle to the opposite sides of the vessel. Such a rudder would have no effect in altering the ship's course, for there would be the same resistance on each side; but it will be obvious that this double resistance would greatly retard the motion. If one of the rudders were placed a-midships, so as to present no resisting surface to the forward motion, the head of the vessel would immediately answer to the helm—the resistance being then diminished one-half. In short, every effort of the rudder in guiding a ship, is an indication of the loss of moving power; and, as it is almost constantly employed, there is consequently a constant loss of power occasioned by this means of steering.

The question then to be considered is, whether the method of steering by means of a moveable resisting surface placed at the stern—which is, perhaps, the best method of guiding sailing vessels—is equally applicable to steam ships; or whether the new mode of propelling ships by the revolving action of paddle-wheels, does not afford other and less objectionable means of steering. It appears to us, indeed, that steam ships possess peculiar capabilities for guiding them through the water, without any loss of power, and with a precision and quickness altogether unattainable by a rudder.

The plan we would suggest, as one method by which this object would be obtained, is this:—Each paddle-wheel might be fixed to a separate revolving axis, worked by separate engines. The paddles, instead of acting in parallel directions to the sides of the ship, should be inclined at a small angle towards its head. This disposition of the paddles is recommended by many engineers, without any reference to their use in steering, as it would prevent the back-water of the paddles from reacting disadvantageously against the vessel. Now, supposing the paddles and engines to be so adjusted, it is evident that when one paddle-wheel is made to act with greater force than the other, the immediate effect would be to turn the head of the ship; in the same manner as when one horse in a carriage moves faster than the other, the carriage is turned round. The acting force of the paddles might be

varied with the greatest nicety, by regulating the supply of steam from the boiler of each engine. There would, in this case, be no loss of moving power, for the temporary diminished consumption of steam in one engine, would cause a reserve of power to be called into action when wanted.

There is another and very important advantage to be gained by the proposed method of steering. Rods, connected with the stop-cocks in the steam-pipes which regulate the supply of steam, might be carried to any part of the ship; and the steersman or engineer might take his position at the head of the vessel, in full view of all the obstacles to be avoided. This, in river navigation especially, would be an essential point, and would be the means of preventing numerous accidents that are almost unavoidable in a crowded river, where the man who guides the vessel cannot see the danger to be avoided, and only acts by signals and commands. Among other minor considerations it may be mentioned, that a ship might be guided in this manner without any exertion of force, as a child could move the connecting rods, and thus bring the ship round in a few seconds; and we conceive that a ship so guided would be much more under command, than where the guiding power depends on the resistance of the rudder alone.

Several other advantages would be derived from a mode of steering like the one we now suggest, and we hope some practical engineers may be induced to work out the principle. The method we have mentioned of giving variable motions to the paddles, is the one that occurs to us as being the most simple; but that is merely a question of practice to be determined by experience. The object to be attained, is to render the power of steam available in guiding the ship without having recourse to a resisting force to produce that effect; and whether it be done by giving variable motions to the paddles, or by putting in action a distinct guiding machine, there would be great advantage gained over a means of steering which impedes the motion of the ship, and is not suitable for the modern improvements in navigation.

NEW INVENTIONS.

HOLMES'S IMPROVEMENTS IN IRON SHIPS, &c.

In the '*Inventors' Advocate*' of May 30, we briefly noticed the importance of Mr. W. D. Holmes's patent for improvements in the construction of iron ships, boats, and other vessels, and for preventing the same from foundering, and also in the application of the same improvements or parts thereof to other vessels; but a full description of it required more attention than we could devote to it the first week after filing the specification. We have since examined it carefully, and shall endeavor to describe its leading parts as clearly as can be done without giving the drawings. The objects of the patentee, appear to be these:—

First, to reverse the principles hitherto adopted for both wood and iron ships, as regards the strength or strain of the ship. Till the present time, ships have been built so as to become bowls on the water, depending for their strength on the walls or outside planking or plates, and which outside has supported the decks and internal parts of the ship. Mr. Holmes constructs the framework of the decks and internal parts of the ship, by a combination of iron frame-work, longitudinally, transversely, and diagonally braced, so as to form a complete skeleton of the ship, or what may be considered the bones, being, as regards the strength of the structure, totally independent of the outside skin or planking. By these means, the patentee justly estimates that much thinner plates can be used for the outside, and the disadvantages of rivetting thick plates dispensed with. The descriptive drawings are taken, we observe, from the plans of the large iron steamer (2,618 tons, old rule) which the patentee designed for the East India Company in 1838, which is about one and a half times the size of the British Queen. The outside plates of the ship, with but little exception, are put together in the ordinary way with the angle iron ribs, but to these angle iron ribs are connected iron knees, to which are bolted stringers, or plates, or bars of strong iron, and carried longitudinally through and along the ship's side from stem to stern, on the level or plane of and between the decks. These stringers on the plane of the decks, which in some cases are to be united by diagonal bracing, are fixed twelve inches apart; between them, the end of the transverse beams of the deck rests, and to them it is bolted between two other iron knees; every six feet below the load water line, and every twelve feet above, a strong iron rib is carried up from the keel along the inside of the stringers, and at right angles to them. These are fastened to the stringers, and transverse beam before described, in the angle which is formed by their connection. Instead of the ordinary uprights, or supports, in the hold between the decks, is fixed diagonal iron frame-work, which, by its connection with other parts, forms a light but very strong keelson; the frame-work of the floors, to which the floor planks are fastened by bolts, is one complete diagonally-braced iron frame. To those parts of large ships most liable to accident, and sustaining the greatest wear and tear; i. e. at the bow, bilge, keel, &c., and in men of war, the whole, or greater part of the outside of the ships are made in panels, the frames of which are made of strong rabitted plates or bars of iron, into which a thin plate is dropped and fixed flush with the outside of the frame; so that, in the event of a hole being knocked in her bottom, or a shot going through, the damaged pannel-plate may be removed and another put in its place, the injury being confined to its own locality. With this, is a new and ingenious mode of putting in the ordinary bulk-head, so as to avoid weakening the section of the ship, as is now the case by the rivets, by which means the ship is strengthened at the bulk-head instead of being almost cut in two. We have no hesitation in affirming, that this part of Mr. Holmes's patent proves, unquestionably, the practicability of building ships of any size.

The next object is the safety of the ship, or the means of its prevention from foundering. This is attained, first, by forming an air and water-tight ceiling to the hold or decks, and the combination of the same with the ordinary vertical bulk-head, with air-tight hatchways and with a double "manhole" entrance; so that, in the event of a hole being knocked into her bottom, the water would be kept out of the ship by the air above, as out of a diving bell or inverted vessel; but to provide for any leakage of air that might arise from the shock or imperfect workmanship, an air pump, or apparatus, is applied, by which air is injected into the chambers, and by which the water is kept out, and men can be admitted through the manhole before referred to, and can work as in a diving bell, to repair any hole, leak, or other damage that may be sustained.

In addition to the closed ceiling, tanks, or boxes, or cases are introduced into the hold, or other parts of the vessel for containing cargo, which are in some cases closed at the top, with an air-tight hatchway, or entrances, &c., connected with the air pump; so that the pump, &c., may be applied to the enclosed hold, or decks, or the boxes. In some cases India-rubber, or other air-tight bags, are used with the pump, to give increased buoyancy to the ship; the pump is also to be applied to command and regulate a water ballast in air-tight compartments, or tanks, &c., which may either be used for the purposes of ballast (when the ship is without, or too light of cargo), or be applied to regulate or alter the trim or immersion of the ship, and particularly in the case of steamers that must either have their paddle-wheels too deeply immersed on setting out on a voyage, or would be raised out of the water by the consumption of coals before the end of the voyage. In the event of a ship getting aground, by ejecting a part of the water ballast she is immediately afloat again. In men of war, and other vessels of large dimensions, the patentee contemplates this being useful in giving stability while in action, or with unfavorable weather, or to supply the ballast that may be required from the consumption of coals; or by lessening her draft of water in fair weather, entering a port, &c.

Another improvement is to prevent corn, fruit, and other goods, becoming heated when stowed in bulk, by passing pipes through the ship for water or air to circulate through; and, in some cases, the fruit, or other goods, is put into water-tight boxes, so that water is allowed to circulate; thus a cargo, otherwise liable to become heated, can be brought from any distance without damage.

A further improvement, is to reduce the resistance of boats on canals and other waters, by connecting the stern of one boat with the stem of another by a flexible joint, so as to form a number of boats into one long boat, by which the sectional resistance to the water is lessened, and at the same time the line of the boats will yield to the curvatures of the canals, and can conveniently be attached and detached for passing locks, &c.

All persons who examine this patent, must admit Mr. Holmes to have fully established the principle insisted on in his report to the East India Committee, in 1838, on the indispensable necessity of the adoption, not only of much larger ships than had been contemplated, but that it was equally indispensable, in point of profit, that they should be built of iron, and by the adoption of his improvements a great reduction in the first cost of wear and tear would be effected. Many parts of these improvements are, however, equally applicable to wood ships, as regards safety to the passengers; and wherever they are adopted, we cannot conceive any case or circumstance in which a ship can be placed in danger. In the fullest sense of the word, they become life-boats, without waste of room, or extra cost. How far the insurance companies, and those who trade in salvage, and those merchants who descend to the iniquitous practice of sending out vessels, insured, to Australia, and other long voyages, with an intention that they shall never return, will thank Mr. Holmes for making every ship insure herself, we have to learn; but when it is recollected, what has been recently proved before a Parliamentary Committee, that there is an average loss of 567 British merchant vessels, valued at three millions sterling per annum, and what is more, with an annual loss of 900 British seamen,* the patentee

*For particulars of above, see Evidence before the House of Commons Committee, of 1836, or abstracts therefrom, in a pamphlet on Steam Navigation, recently published by Ridgway, Piccadilly; and Richardson, Cornhill.

of the above deserves, at least, the thanks of his country.

Some opposition will, no doubt, be offered on the general introduction of large iron ships, which enable steam to completely supersede sailing vessels, by those who have large investments in wooden property, but there is no cause for alarm. Foreign enterprise will compel this country to keep pace with the march of improvement, both in the naval and mercantile marine.

NEW MACHINE FOR EXCAVATING, &c.

A machine has been constructed by Mr. A. Livingstone, for the purpose of facilitating the excavation of trenches, canals, &c, which is peculiarly adapted for use in our West Indian Colonies, where this kind of work is much required; and owing to the great labor usually necessary, it becomes very difficult to get it properly done. We have seen a model of the machine, the principle of which is an adaptation of a very simple kind of the dredging machine to a kind of locomotive steam-engine. It is a self-acting apparatus, worked by an engine of six-horse power; which requires only the attention of one man; and it is so constructed as to move along the ground, or on water, as the excavations are made. One of the peculiar advantages of this machine is, that it may be applied to numerous useful purposes, as a substitute for manual labor, in many of the most arduous and fatiguing operations. For instance, it may be applied, in the first place, in making new drains and trenches, in which case it moves itself along the ground as the earth is cut away. It may, in the next place, be used for deepening and cleansing the trenches already formed, for which purpose it may, with little trouble, be placed on a punt and floated on the water. It is also capable of being adapted to dig holes for planting sugar canes; and lastly, the steam-engine is made so portable, that it may in a few hours be placed on a small iron boat, and made to act in propelling it along the canals and rivers, and thus convey the produce from one part of an estate or island to another. The machine is so constructed, that the power of the steam-engine may be increased or diminished in proportion to the nature of the soil through which it has to work; whilst the simplicity of the arrangement will enable any intelligent native to manage it. The weight of the whole, including the boiler and engine, is not more than 30 cwt., which does not much exceed the weight of a common stage-coach. The importance of an apparatus of this kind in the West Indian Colonies, may be imagined, when it is known that so much depends on the cleaning out of the trenches, that, if not properly attended to, the whole produce of an estate is sometimes completely destroyed by sudden inundations.

SPRING-HANDLED CRICKET BATS.

A spring-handled bat has been invented by a cutler at Salisbury. It differs nothing in appearance from the common bat, but owing to a bar of steel being let into the middle of the handle, it drives the ball to a great distance, with very slight exertion on the part of the striker; while, at the same time, it is entirely free from the unpleasant jar to the hand to which even the best poised bats are at times subject.—*Bath Chronicle.*

SCHOOL OF DESIGN, &c.

The annual distribution of the premiums in this useful institution took place on the 26th ult., in the great room, formerly occupied by the principal paintings in the Royal Academy's exhibition.

The Right Hon. H. Labouchere, M. P., acted as chairman. A considerable number of ladies and gentlemen were present, amongst whom we observed Sir R. H. Inglis, Bart., M. P.; Sir Denham Norreys, Bart., M.P.; Sir David Wilkie, R. A.; Henry T. Hope, Esq., M. P.; Sir C. H. Cockerell, Esq., R.A.; C. L. Eastlake, Esq., R. A.; J. Thomson, Esq.; F. F. Gibson, Esq.; Rev. J. Lonsdale, Principal of King's College; T. Wyse, Esq., M. P.; Rev. J. Allen; Mr. B. M. Ker.

C. R. COCKERELL, Esq., R. A., read the report of the committee, and stated that the committee had taken great pains to investigate the various claims of the numerous candidates, and the result was that, finding an increase of talent in the school, they had decided upon giving six premiums of five guineas each to the students who had displayed the greatest merit in the highest class; and on the same account they had thought proper to bestow four additional premiums, of smaller amount; and four others to the students in the elementary class; and to seven students books were given, as the reward of regularity, diligence, and good conduct.

ADDITIONAL PREMIUMS.

1. To Mr. E. Stone, 5*l.* 5s., for the best design for figured silk for ladies' dresses.

2. To Mr. J. C. Harrison, 5*l.* 5s., for the best design for a figured ground mousseline de laine.

3. To Mr. O. Hudson, 5*l.* 5s., for the best specimen of arabesque painting.

4. To Mr. G. F. Lambart, 5*l.* 5s., for the best design of an architectural frieze, intended for sculpture.

5. To Mr. O. Hudson, 5*l.* 5s., for the best design for jewellery in the Elizabethan style.

6. To Mr. W. C. Wild, 5*l.* 5s., for the best design for a drawing-room paper.

7. To Mr. G. F. Lambert, a copy of "Flaxman's Lectures on Sculpture," for the best model in plaister from a prescribed outline.

8. To Mr. O. Hudson, a copy of "Jackson on Wood Engraving," for the best design of an ornamental title-page drawn on wood.

ADDITIONAL PREMIUMS AWARDED BY THE COUNCIL.

1. To Mr. G. Thompson, 2*l.* 2*s.* for his design for jewellery.

2. To the same, 3*l.* 3*s.*, for his specimen of arabesque painting.

3. To Mr. C. Gardner, 2*l.* 2*s.*, for his design for a drawing-room paper.

4. To Messrs. W. Taylor and J. West, each a book, for their models in plaister, from outline.

PREMIUMS TO THE ELEMENTARY CLASSES.

1. To Mr. M. Dessurne, for the best drawing of the figure, from plaister.

2. To Messrs. Andrew, Durrant, and Herdman, for their drawings of ornament, from plaister.

3. To Messrs. Gritton and Burton, for their drawings of ornament and the figure, from lithographs.

4. To Messrs. Dolby, Holmes, Etches, Brownsmith, Peaton, and Findon, for their copies of outline ornament.

5. To the following students a book each, as the reward of general good conduct and regularity of attendance:—Messrs. Raffles, Trees, Kinghorne, Godfrey, Carter, M'Shane, Bingley.

The students then came forward, and the hon. chairman presented to each his reward, with a suitable compliment and admonition. When this act was completed,

Sir DAVID WILKIE addressed the meeting, and stated the great satisfaction he experienced from witnessing the progress of improvement in this school, for the utility of which he gave his decided testimony; and also from the impressive manner in which the President had performed this duty, and advised the students; and also for the aid afforded to it by such men of known talent as Mr. Cockerell. He told the students, that there was no royal road to eminence in the arts; natural talents must be aided by long and laborious application. He ridiculed the vulgar, though popular notion, that whatever is great in art must be derived from inspiration; this causes these things called "prodigies in art" to be brought forward occasionally as wholly "untaught artists," and this is stated gravely, as a recommendation for those crude productions, instead of an apology for them. He recommended the students not to be too proud of their premiums, but to increase their diligence. He concluded by moving an address of thanks to the right hon. Chairman.

Sir R. H. INGLIS seconded the motion, and expressed his satisfaction at the appearance of talent displayed on the walls, and at the manner in which the right hon. gentleman had conducted the business of the day, which he looked upon as one of the most important of his duties as a member of the British Government in promoting the object of raising the beauty of our manufactures to equal those of any foreign nation.

The Right Hon. CHAIRMAN returned his best thanks to the meeting for their kindly feeling towards his humble though sincere exertions in promoting the elegance and superiority of British manufactures, and this he did from its being so important in preserving and extending our foreign trade; and in this great effort he felt proud to see that the best of the British artists had come forward nobly, as was seen here to-day, for the purpose of aiding with their talents the best interests of their country; and their example would produce the happiest effects on this great national purpose.

Mr. Labouchere then left the chair, and the company remained some time examining the various specimens, amounting to some hundreds.

VARIETIES.

Restoration of York Minster.—On Saturday morning last, a meeting of noblemen and gentlemen took place, at the Thatched-house Tavern, St. James's-street, for the purpose of adopting measures, and opening a subscription, for the restoration of York Minster. There were in the room—The Archbishop of York, the Bishop of Durham, Earl de Grey, Lords Wharncliffe, Milton, Feversham, and Wenlock, Sir John Lowther, Sir J. B. Johnstone, Hon. E. R. Petre, Mr. J. Childers, M.P.. Mr. H. Vernon, M. P., Mr. H. Stansfield, M.P., Mr. E. Lascelles, M.P., &c. The Earl of Harewood occupied the chair. A number of resolutions were put, and were agreed to, expressing that a provisional committee be formed to carry out the intentions of the meeting, that a public meeting be convened to take place at York on the 7th of August, and that Sir R. Smyrke be appointed to restore and rebuild the dilapidated portion of York Minster. A vote of thanks having been presented to the chairman, the subscription papers were produced. The Archbishop of York subscribed £1,000; Earl of Harewood £500; and Lord Wenlock £200. £3,350 15s. was subscribed before the meeting adjourned.

Stationers' and Paper Manufacturers' Provident Society.—A dinner to celebrate the establishment of the Stationers' and Paper Manufacturers' Provident Society, took place on Tuesday last, at Lovegrove's West India Dock Tavern, Blackwall, when the chair was taken by the president, Sir James Williams; he was supported on his right by the master of the Stationers' Company, George Rowe, Esq., and on his left by Thomas Gardiner, Esq. Most of the principal wholesale stationers and paper manufacturers were present. After the usual toasts, the honorary secretary, Mr. John E. Cooper, reported to the meeting, that though the society was only just established, they had already received donations and subscriptions to the amount of £2,027 17s., and in the course of the evening he read several lists of additional donations and subscriptions, amounting to £626 10s. 10d. The chairman, in a very impressive address, placed in the strongest light the advantages to be derived from this society, not only to assistants in relieving them in the time of sickness and old age, but also to principals, in promoting good feeling amongst the trade at large, and smoothing down any rivalries and jealousies which competition in business might produce among them. In

the course of his speech, he produced the folding-stick that had been presented to him by his master upwards of sixty years ago, when first bound apprentice. He retired from the chair about half-past nine, when he was succeeded by Mr. John Evans, and the hilarity of the evening was kept up to a late hour.

Midwifery in Paris.—Prizes, consisting of gold and silver medals, were on the 25th ult. distributed to nine female pupils, of the Midwifery School at Paris. These women had been sent to Paris, to be instructed in midwifery, from different parts of France, at the expense of the departments.

Statistical Society of France.—On Sunday last, the Statistical Society of France held its general annual meeting; the Duke de Doudeauville in the chair. The great prize of 1000 frs. founded by M. Montinho de Lima, ex-ambassador from Brazil to France, for the best statistical account of the Empire of Brazil, was awarded to M. Oscar Mac'Carthy.

A New Method of Spinning Flax by Machinery.—It is stated that a new method of spinning flax by machinery, has been invented at Ghent, and that orders for machines to the amount of 400,000 frs. have been received by one of the largest machinists in the country. Attempts are also making to add a power-loom to the machinery.

White Moss.—Some interesting discoveries have been made by the parties engaged in the cultivation of White Moss, near Middleton. It appears that the present site of the moss, which is from four to ten feet in depth, had been formerly a wood, the trees of which now lie prostrate below the peat earth that forms the surface of the moss. Nearly all the trees that have been found, were lying from west to east. They consist of oaks, birches, alders, and one or two fine yews; the bark has perished entirely from the oaks, and their surfaces become shaly and brittle after exposure to the air, whilst the interior of the wood remains very hard, and nearly the color of iron. The alder bark has also perished, and the wood is generally thrown up in a slimy and decomposed state, and the smooth covering of the birch may still be seen shining and streaked. Some of these trees were, in part, charred when found; and the writer of this has a piece of perfect charcoal, taken from the underside of the stem of a fine yew. One enormous oak lies towards the north-west of the moss, in a shallow trough of firm sod; its trunk is about 12 feet round, and it has been traced to about 15 yards in length; its position about west to east. No marks of any wood-cutting tool whatever have been found on the trees, or their roots, or their branches; and the intelligent and observant gentleman who superintends the improvements (Mr. Dixon) is of opinion that they have been overthrown simultaneously, or nearly so, by some great convulsion of nature. The trees are generally charred, where they are so at all, on the under side. In a notice of the cultivation of White Moss, in one or two of the Manchester papers last week, it was stated that the part purchased from Dorning Ramsbottom, Esq., and appertaining to the township of Alkrington, was 30 acres; it should have been 70. The whole tract in course of cultivation is 100 acres.—*Manchester Guardian.*

The Ground-fish of Bootan.—Mr. J. T. Pearson has communicated to the Asiatic Society of Bengal, on the authority of Mr. Russell, of Rangpore, the following account of the *bora chung*, a ground-fish of Bootan:—The bora chung is a thick cylindrical fish, with a body somewhat like a pike, but thicker, with a snub nose; it is two feet long, and weighs about three pounds. The color is olive green, with orange stripes; the head speckled with crimson spots. It is eaten by the natives of Bootan, and said to be delicious. It is found on the borders of the Canal Nuddee, which falls into the river Dhallah, a branch of which runs into the Teestah, at Paharpore. It is not immediately on the brink of the water, however, that the fish is caught, but in perfectly dry places, in the middle of a grass jungle, sometimes as far as two miles from the river. The natives search this jungle till they find a hole, about four or five inches in diameter, and into it they insert a stick to guide their digging a well, which they do till they come to the water; a little cow-dung is then thrown into the water, when the fish rises to the surface. Mr. Russell has known them to be from six to nineteen feet deep in the earth. Their other habits are not less curious. They are invariably found in pairs, two in each hole, never more nor less. He has seen them go along the ground with a serpentine motion, very fast, though the natives say they never voluntarily rise above the surface. In some places they are very common, and live a long time when taken out of the water, by being sprinkled over occasionally. One, which Mr. Russell thinks is the female, is always smaller, and not so bright in color as the other. Mr. Pearson saw two of the fish alive.

The Carpenters of Toulouse have struck for an advance of wages, and according to the system of intimidation adopted in England on like occasions, they have prevented every one from working, and have sent deputations into the neighboring country to put a stop to all carpenters' work.

The Silk-Worm.—Mr. Leeds, of St. Edmund's, has this year again continued the rearing of silk worms. He has now nearly fourteen thousand in various stages, raised from eggs which were procured for him from Italy, and these in a short time will be spinning. The object of Mr. Leeds, and of those associated with him, is to prove that the silk-worm can be reared to advantage in this country; and, if it be possible, the steadiness with which he has pursued his object for so long a period deserves to be rewarded with success. At present, the difficulty of procuring food has been the great evil. That, he is partially overcoming, through the aid of Sir Robert Harvey, Messrs. Mackie, and by his own means, and he speaks of his progress with the ardor of one who is devoted to the cause. He is quite ready and anxious to exhibit the worms to any ladies or gentlemen who will honor his dwelling with a visit.—*Norwich Paper.*

On the External Use of Living Ants (formica rufa) by Dr. Schreiber.—The summer division of the author's hospital lies in a wood, where there are so many ant-hills, that the thought struck him of drawing some advantage from them for his patients. As ant-baths and tincture of ants were of no great use, he tried the living insects in paralysis, hemiplegia, paresis, and inveterate arthritis. The ants are to be taken directly from their hill, and put in a bag; and this bag is to be tied over the limb, in such a manner that the ants cannot escape (but obtain access to the skin.) Some time after their application to the paralyzed limb, the patient begins to feel the running and biting of the ants, by which they gradually excite a kind of electrical twitches, and a feeling of warmth, which gradually extends over the whole body. Moreover, by their ethereal principle, they cause as violent a perspiration over the whole body as if the patient were in a vapor bath. The paralyzed part must be kept in a bag with the ants for two or three days. The patient is then to rest for a day, after which the ants are to be applied again; and this is to be repeated till the object is attained. In 1835 Dr. Schreiber obtained a favorable result in seven cases of the paralysis; in 1836, in four, and in 1837, in three; by which he was encouraged to use the same remedy in chronic rheumatism and gout. It is unnecessary to remark, that this remedy alone cannot be of much service, if the case is complicated with syphilis, scurvy, or scrofula; but the military hospitals have plenty of uncomplicated cases, and in three years forty six patients under this head were cured. Dr. Schreiber now began to use the remedy in dropsy, proceeding from inactivity of the skin. In anasarca, it was found sufficient to tie up the lower extremities in bags with living ants, and thus obtain profuse sweating and a cure. This method of treatment, supported by gentle purgatives and sudorifics, succeeded in twenty-one cases. (The German translator here remarks that he cannot call ten grains of jalap with the same quantity of calomel, a "gentle purgative.") In a case resembling elephantiasis, where the leg was cold, hard, and swollen, and a variety of treatment had been employed in vain, the disease was entirely removed in twenty days, under the use of living ants, and the patient was dismissed cured. The author mentions incidentally, that, in Little Russia, they employ a home-made spirit of ants, called *muraschkowka*, to prepare a punch which is used in many varieties of colds, with very great advantage.—*Medical Gazette.*

Literary Men on the French Pension List.—One of the French papers has just published a list of literary men and females who receive an annual allowance out of the secret service money at the disposal of Government. The number of these pensioners amounts to eight and thirty. The smallest amount of allowance is £40, and the greatest £120. Amongst those who enjoy the latter is the widow of Abbe Remusat.

Good effects of Cheap Postage.—The following is an extract of a letter from a gentleman in Ross-shire:—"I have a very respectable man who has wrought in my garden for two years at 9s. a week, and thought himself amply paid. The rate of wages was rather above the average here, which is 1s. 6d. in the long, and 1s. or 1s. 2d. for the short days. I had also two of his sons, hired servants by the half-year on my farm, and a daughter engaged by the day in spring and autumn. One of the family went last year to the south of Scotland in search of employment at a railway. I believe since the reduction of postage, this lad has been corresponding with his father, and the result has been, as the latter told me the other day, that he had resolved to go south with his family, being assured that they could earn double what they were doing here. For their sakes I was glad to hear it; and I am sure they will do well wherever they go, as they are extremely well-conducted people. "My other fact relates to a poor widow in this town. She was the mother of two sons and a daughter. The latter died some years ago of consumption, after becoming a full grown and very interesting woman. One of the sons went to London—got into a mercantile establishment, and was promoted till he had £300 a year—then married—went into business for himself, and was ruined. The remaining son lived with his mother, and they were both helped by the elder brother as long as he could; but when this help failed them, the younger brother, who was a cabinet-maker, I believe, also went south, and the widow was left alone, and being destitute, for some years she has been getting relief from the poor's funds. Mrs. —— sees her occasionally; and soon after the reform in the Post-office, the widow came to her to say how inexpressibly overjoyed she was by receiving a letter from her younger son, from whom she had not heard for some years, and who, she thought, was dead. The postage, too, and all (as she said) was paid! It turned out that he had several times written to her, and never having any reply, had discontinued addressing her, but thought of doing so once again under the penny post. The letters, no doubt, would have come, and gone back to the dead letter office, and in due time been burned. The widow says, that two or three years ago she heard there was a letter for her in the post office, the postage of which was 1s. 3d., which she never for a moment could dream of paying. The letter which she did receive, she said with tears in her eyes, gave her more joy than a present of a peck of gold."—*Sun.*

Accident at the London Gas-works, Vauxhall.—An accident of a very melancholy nature has happened at the above extensive establishment. The company, in addition to their works at the water-side, are erecting other extensive gas factories in Vauxhall-walk, and Messrs. Richardson and Lowe, of Dudley, have contracted to build the

immense gasometers, which are now nearly completed. Over the top of these gasometers, and between the roof, are passed a number of iron bars, on which a flooring is placed; the bottom of the gasometer itself has fifteen feet depth of water, which is used for purifying the gas. A man named Smillington, who was in the employ of Richardson and Lowe, was on this flooring, attaching the tackle, or chain, that suspends the weights outside the gasometer, when by some means he fell through the bars to the bottom of the gasometer into the water, and another man, who was also on the boards, nearly shared the same fate. An alarm was immediately raised, and drags happening to be on the spot, they were forthwith taken to the roof; there, however, a painful difficulty arose; in consequence of the iron bars underneath it was almost impossible to work them, and at last it was found necessary to remove some of the plates of the gasometer. Under these unfortunate circumstances, an hour and a half elapsed before the body could be got at, and it is needless to add life was quite extinct. Information has been forwarded to Mr. Carter, the coroner.

Blowing up of Cannon-mills Bridge.—On Friday, a vast multitude of persons assembled to witness the blowing up of these mills. About six o'clock, tho trains communicating with 12 charges of gunpowder of 4lbs. each, inserted at each base of the arch, to the depth of about four feet, were set fire to; hardly had the men time to make good their escape, before seven tremendous explosions took place, carrying away the chief of the fronts of the base of each arch. Much incidental damage was done, but still the bridge remained standing. After clearing away the foundation, however, of the bridge, at 11 o'clock it fell with a terrific crush, but with no damage to any person.—*Caledonian Mercury.*

Important Discovery of Coal.—Mr. Fitzgerald, the owner of extensive property at and near Pendleton, Lancashire, has had the resolution to explore the bowels of the earth to a depth hitherto unprecedented in Great Britain, with one exception, in order to ascertain whether any, and what number of beds of coal could be discovered. It was first thought that the experiment would be a hopeless one, but, on the contrary, he has succeeded beyond his most sanguine expectations, having discovered four beds, one of which is seven feet in thickness. There are, indeed, 32 beds in the whole, but only four can be worked to advantage. This discovery will be of great importance to Manchester, and especially to some part of Salford, the coal being well adapted for steam-engines, dyeworks, &c.—*Leeds Mercury.*

Paisley.—Depression of Trade.—We regret to state that, for some time past, a very serious depression of trade in the weaving department has been felt here, and that a considerable number of hands are out of employment. The exact number of these is not known, but we may state, that of the schedules prepared and laid in the chamberlain's office for the unemployed to take out and fill up, 160 have been taken out, of which 100 have been returned, filled up in a way showing the state of destitution. Means are at present in operation for re-establishing the work-committee, to give out plain work to such as apply. The greater number of sufferers, as might be supposed, are to be found in the weaving department, but in various other trades connected therewith, several unemployed hands are to be found. The prospects of the autumn are, in the opinion of several of the most intelligent manufacturers, of a very gloomy tinge.—*Paisley Advertiser.*

Holman, the Blind Traveller.—Lieut. Holman, the celebrated blind traveller, at present one of the Poor Knights of Windsor, finding his love for travel irrepressible, has, with the sanction of her Majesty, obtained from the Vice-Chancellor a relaxation of the strict rule of the society, requiring a residence at Windsor, and will shortly again quit this country on a fresh tour in foreign parts. This extraordinary man, although suffering under the deprivation of sight, has already visited every part of the known world.

State of Birmingham.—To give anything like a correct picture of the depressed state of trade in Birmingham, and its consequences, would be no easy matter; a few facts may give some idea. The oldest, most extensive, and respectable merchants, manufacturers, and traders, coincide in representing the present depression as unprecedented in their experience. 10,000 applications, by working men and women, for free passages to Australia, have been made, and refused, within the last two months, at one emigration office in the town. Between 20 and 30 good houses and retail shops are untenanted in three of the principal streets, and thousands of middle and small rented houses are unoccupied in every part of the borough. The walls are literally covered daily with auction-bills, and a purchaser can hardly be found for either leasehold or freehold property. The brokers' shops are crammed with goods, purchased at half the cost price. The pawnbrokers, being completely stocked, refuse any except what are termed best pledges. Thousands of mechanics are living on half wages, thousands on quarter wages, and numbers of creatures are sustained by means known only to the Almighty himself. Upwards of 300 applications were made to the Gloucester Railway Company for situations as guards, &c., within the last month. The poor-rate is doubled, and numbers are leaving their houses to escape paying it. All is gloomy, and no one can see a prospect of improvement. In the midst of these symptoms of distress, we have an apparent anomaly, of which we have in vain sought an explanation. Everywhere in the outskirts, streets are being laid out, and houses rising, as if by magic. Walk out to-day, you have a green field—to-morrow it is covered with elegant buildings; and in 24 hours more they are let and tenanted. We believe we do not exaggerate, when we say, that for the last 12 months not a house in Edgbaston parish has stood empty for a couple of days; and yet, in that period, there cannot have been fewer than two hundred houses added to the number, and all of them substantial and respectable. In every direction, building is proceeding with a similar railway speed, but chiefly in Edgbaston is the progress remarkable.—*Birmingham Journal.*

France.—A New Omnibus.—The steamer Phœnix landed at Havre last week, from London, a new kind of omnibus, which it is expected will produce a complete revolution in those carriages in Paris. This omnibus is stated to weigh 200 kilogrammes less than those in present use. The elegance of its construction, and its lightness, are remarkable, and yet it is adapted to carry eighteen passengers; viz., twelve inside, four on the seat in front, and two on the box; this number is exclusive of the driver and conductor. The omnibus is beautifully fitted up, and it is intended to carry passengers from the centre of Paris to the station of the Versailles railroad. Twenty-five similar omnibuses have been ordered by the company from the manufacturer in London, and are to be ready by the 5th of August next.

Reduction of Duty on French Brandy.—We have received a communication, that the treaty will be signed at Paris in a week or so; and the reduction will immediately follow. The amount of duty to be taken off, it is supposed, will be 8s. per gallon.—*Yorkshireman.*

Large Steamer.—Where the wonders of steam are to stop, no one can determine. The same day which saw the Archimedes pass the quays of Greenock, also witnessed the first trial of the Achilles, previous to her taking her place on the station for which she has been built, between the Clyde and Liverpool. This splendid ship, built by Messrs. Steele and Co., of this port, is about 1,000 tons burden, and has engines, by Messrs. Caird and Co., also of Greenock, of larger size than the Great Western. Although the day was unfavorable, blowing a gale, the speed of the ship was between 14 and 15 miles an hour. This extraordinary speed was accomplished by the engines, which have a stroke of seven feet, making 19 and 20 revolutions per minute with the greatest steadiness.—*Greenock Advertiser.*

Third Centenary of the Discovery of Printing.—The third centenary of the discovery of the art of printing, is now being celebrated throughout the several cities and towns of Germany. At Hamburgh, Berlin, Copenhagen, Mayence, Cologne, and Weimar, committees of the principal inhabitants have been established, and the preparations which, during the past few weeks, have been making, are on the most extended scale of magnificence. On the morning of the 24th of June (Wednesday) the inhabitants of Leipsic were to congregate in the churches to return thanks to the Almighty for the discovery of the art of printing. At ten o'clock, the various corporate bodies were to form in procession and parade the streets; and on arriving at the market-place, a grand vocal and instrumental concert was to take place, a number of splendid compositions having been written expressly for the occasion. At three o'clock, a grand entertainment was to be presented to the company in the Augustus Platz, where accommodation was provided for 3,000 persons. In the evening, the city was to be generally illuminated. On the 25th a meeting of the *literati*, booksellers, publishers, printers, and compositors, was to be held in the market place, and at three o'clock the grand oratorio composed in celebration of the event was to be performed in the cathedral church. The entertainments of the evening were to conclude with a grand ball, and the following day was to be devoted to the festivities of the people, accompanied with fire-works and torch-light processions.

The inauguration of the statue of Gutenburgh, took place at Strasburg on the 24th ult. Deputations from the printers of Paris, and from many other towns of France, and other parts of the continent, attended to give *eclát* to the inauguration of the statue of the inventor of printing. The fêtes on the occasion lasted several days, but the most perfect order was observed throughout.

REPORTS OF SCIENTIFIC MEETINGS.

ROYAL GEOGRAPHICAL SOCIETY.

May 25. G. B. Greenough, Esq., F. R. S., President, in the Chair.

EXTRACT FROM THE PRESIDENT'S ADDRESS.

Presentation of the Patron's Medal to R. H. Schomburgk, Esq., and the Founder's Medal to Major H. C. Rawlinson.

In the address delivered by the President at the last anniversary of the Society, it was stated that the Patron's Medal had been awarded to Mr. R. H. Schomburgk, for his perseverance and success in exploring the territory and investigating the resources of the colony of British Guiana, and a large tract of the continent of South America immediately adjacent.

In November, 1834, Mr. Schomburgk was engaged by this society to explore the interior of British Guiana, and afterwards to connect his astronomical observations with those of Baron Humboldt, on the Upper Orinoco. His reports upon the colony have appeared from time to time in the Journal of the society. Recently, Mr. S. has further published a description of British Guiana, geographical and statistical, exhibiting the resources and capabilities of that valuable colony. These several publications are replete with valuable information in respect to

a large extent of country belonging to the British crown hitherto unknown. Having completed his examination of the great water-courses and physical geography of that region, in the winter of 1838-9, Mr. S. proceeded westward, to execute the ulterior object of the society, and to connect his positions with Esmeralda, the most easterly point determined by Baron Humboldt in 1800; to do so, he had to traverse 700 miles of a country never yet trodden by any European, so far as we know, an attempt in which he suffered greatly from fever, fatigue, and privation of every kind—for the details of this important journey, I must refer you to the forthcoming part of the Geographical Journal. But I cannot omit to call your attention to the unwearied perseverance and undaunted zeal with which this gentleman has carried out the plan of the council, and accomplished to the fullest extent the interesting objects which the Geographical Society originally contemplated in employing him.

The council have deemed Mr. Schomburgk's labors worthy of the highest reward it is in their power to bestow. They have awarded to him the Patron's Medal for the year 1839; and it may be satisfactory to the society to be informed, that in such estimation are this gentleman's labors held by her Majesty's government, that they have selected him, as I understand, to return to Guiana, in order to undertake the important and delicate task of laying down the boundaries of the British possessions in that part of South America—a measure, the necessity of which his own observations have forcibly shown, if the sovereignty of Great Britain is to be asserted as it ought to be, and if the defenceless natives are to be duly protected from the savage inroads of the slave traders of Brazil. That the reduction of those tribes to Christianity and civilisation is well worthy the attention of an enlightened government, I need not say, nor that the consequences thereof will be of the first importance to the neighboring colony, where the want of a laboring native population is acknowledged to be the only drawback to its more rapid advancement. If such should be among the fruits of Mr. S.'s travels, the society will have additional cause for self gratulation.

The Founder's Medal has been likewise awarded to Major Henry Creswicke Rawlinson, in testimony of the services he has rendered to geography by his researches in Susiana and Persian Kurdistan, and for the light thrown by him on the comparative geography of those regions. Major Rawlinson is a distinguished officer in the Bombay army, who, at the request of the Persian government, has for many years been quartered in Persia, and entrusted with the command of a corps of cavalry. The papers which entitle him, in the judgment of the council, to this public testimony of your gratitude and respect, and which have appeared in the IXth and Xth volumes of the Geographical Journal, are the result of the information he was enabled to procure, either in his marches through that country, or in the course of his travels when not professionally employed. The area described, comprehends the provinces of Kermanshah, Luristan, and Khuzistan.

MICROSCOPICAL SOCIETY.

Professor Owen, F. R. S., &c., President, in the Chair.

The minutes of the preceding meeting having been read and confirmed, and new members elected, the Secretary announced a donation of a box of insects from Mr. Curtis, collected in Gambia. Among the insects was a moth, the scales of which were interesting objects for microscopical examination. The President stated that those members desirous of possessing the scales, might obtain them upon application, as they were sent for distribution.

The discussion on Mr. Dalrymple's paper on the genus *Closterium*, read at the last meeting, was resumed, the matter of dispute arising from some parties considering them to be animal, while others affirm they are vegetable productions.

Mr. Dalrymple rose and addressed the meeting on the subject, apologising that from want of time and specimens, he had not been able to carry his experiments farther. He was, however, of opinion, that if upon exposure to a dark chamber for a length of time, the non-action of light rendered them paler, he should then be inclined to consider them to belong to the lower vegetables, as this effect is one peculiar to plants, especially those of a green color, which are invariably blanched when grown in situations where light has not access.

Another point of interest is that in connection with the young, and Mr. D. is strongly inclined to consider them of animal nature, from the circumstance of the young being only *one-tenth* the size of the parent, and developed from eggs.

Mr. Owen rose, and said that as far as Mr. D.'s observations had gone, he had every reason to believe their animal nature; and he was inclined more particularly to believe them as such, as the author of the communication had distinctly described the coverings of the *ovum* and *nucleus*.

Mr. Dalrymple then stated as his belief, that the supposed *ovum* contained more than a single *nucleus*, as he had found it to be composed of a number of granules, which he considered to be *nucleated ova*.

Dr. Lindley observed, that if it should turn out that there is no starch, upon the application of the test *iodine*, it would go to prove that it was of animal organisation. He stated that Mohl had discovered starch in *Conferræ* mixed with *Chlorophylle* (which is the green matter of the plant); he is inclined, however, to think, that in some of the lower microscopic *fungi* it is absent.

Several gentlemen attended with their microscopes, and exhibited various interesting natural objects.

ROYAL BOTANIC SOCIETY.

Thursday evening Meeting, June 25. The Duke of Richmond, President, in the Chair.

The ordinary meeting of this institution was held at the Rooms in Pall-mall. Upon the tables were various presents, and exhibitions of different objects connected with botany. The most striking of these were some magnificent Cacti, from the gardens of Mrs. Lawrence, and a collection of artificial flowers, formed from the feathers of birds, made by Mrs. Randolph.

The following names were submitted to ballot, and the election took place:—The Duchess of Cleveland, Earl of Bandon, Earl of Surrey, Miss Kerrison, Mrs. Smith, Captain Hamilton, John Deacon, Esq., Andrew Arcedeckne, Esq.

After the usual preliminary business, his Grace the Duke of Richmond delivered to Mr. Papworth the premium he had obtained for the exhibition of his design for laying out the gardens, which had been considered by the council more adapted to their objects than the others which had been submitted to their inspection.

Sir Edward Kerrison then rose, to ask why there seemed at present so little advance made in carrying the plan into effect? As one of the founders of the society, he felt anxious that the gardens should be rendered attractive as early as possible.

The reply made by the Secretary was, that the lease was not finally settled; that some negotiations were going on, with the hope that the rent would not be raised, and that the society might hold the ground on the same terms as the late Mr. Jenkins. It was, however, expected, that during the present week the lease would be fully arranged.

Mr. Sowerby made some observations on the preparation of a tea, made from the Ilex, to which his attention had been directed in consequence of what had been said at the last meeting with regard to the Paraguay tea, which was obtained from the same source. He exhibited a specimen of the leaves dried for the experiment.

Dr. Sigmond then delivered an address upon the objects embraced in the study of botany, and upon the views which were entertained by those under whose auspices the society had originally been founded. He commenced by observing, that the great end and aim of the study of vegetable life was to become acquainted with the great laws by which nature regulated this portion of the creation, and to point out which individuals of this great kingdom might be applied for the comfort and happiness of man. The most trivial, and apparently insignificant herb that grew, was absolutely necessary to form a link in the chain of existence. The sea-weed, the lowliest moss, were alike parts of the great whole. Their very death was the first source of life to higher classes of living beings; their decay formed the first mould in which quickly sprung up a more fully developed order of herbs; and whole regions of the earth, and desert plains, gradually became magnificent forests from this humble source. The objections that were raised to this study were,—the difficulty of remembering the names and terms, and the minuteness of many of the inquiries. The first of these was the result of attempting to create a universal language, borrowed from the Greek and the Latin, which might be generally understood; but this had proved a perfect failure; it seemed to be a proof of the truth of the sacred doctrine, that man had a penalty to pay for his arrogance in the confusion of tongues, for a universal language had been found so impracticable, that the most learned men were now abandoning so unprofitable a scheme. That some individuals examined everything with a microscopic eye was true, and sometimes the ardor with which an apparent trifle was followed excited a degree of ridicule; but these little observations were eagerly seized by the higher order of intellect, and from the minutest researches was woven one great chain of truth, for on a number of facts reasoning must depend. He then proceeded to point out the benefit which the agriculturist, the manufacturer, the merchant, must derive from the study of botany—how much even the legislator might be assisted. He instanced the growth of the corn-bearing plants; how much of the superiority of physical if not of mental power arose from the cultivation of wheat in preference to the other Cerealia; he dwelt upon the growth of cotton in India, of the grape in various countries, of various articles used as dyes, in naval and domestic architecture, and the various purposes of life. The morals, the diseases of man were influenced by vegetable food. The theory of Malthus, that as human population increased, his means of subsistence diminished, was fully disproved by botanical researches. Dr. Sigmond illustrated this subject by many curious and interesting facts; and concluded by stating that it was the wish of the council rather to render the meetings generally popular than strictly scientific. To the Linnæan, to the Medico-Botanical Society, the Botanical Society, and to other bodies, would be left the discussion of the more abstruse points. In the essays and papers which they hoped to receive, they would rather wish that the general state of society should be considered, than any attempt to address those who were already conversant with the science. It was to be remembered that when Linnæus came to this country, in expectation of publishing in the city what he called the life-spring of human existence, he was disappointed at the coldness of his reception, and at the inattention which was paid to a science elsewhere so ardently cultivated; and that he published in Holland the works he had destined for this country. There still existed, Dr. Sigmond feared, the same apathy, because the usefulness of the science to many had not been thoroughly demonstrated; but when the advantages to society were properly and clearly explained, when it was divested of much of its tediousness, and of its borrowed language, it would be found that the study would be pursued with as much avidity as it was on the Continent; and that not only the mere beauty of the flowers, and their perfumes, would be the subject of inquiry, but the uses to which they could be applied.

The society then adjourned. The members were highly gratified by the interest taken in the proceed-

ngs by the noble president, and by the courtesy and kindness which render the presence of the noble duke so acceptable at all public meetings.

THE THEATRES.

"See that the players be well used."—*Hamlet.*
"Nothing extenuate, nor aught set down in malice."—*Othello.*

HER MAJESTY'S THEATRE.—DONIZETTI'S *Lucrezia Borgia* was performed on Tuesday, it being the second time of its representation this season. GRISI enacted the part of *Lucrezia*, and certainly a brighter or more able representative could not have been found. We must go back to the days of PASTA to find anything equal to the effect she produced on Tuesday night. In the scene where she is forced to witness the poisoning of *Gennaro*, and also where she has unwittingly included her son amongst the number whom revenge has destroyed, she displayed a fine burst of pathos and feeling, combined with gracefulness and dignity. It was a display that real and intense feeling could alone produce. "Leggiadra amabil siete" was rendered by her so beautiful, that it commanded a unanimous *encore*, which honor was deservedly shared by MARIO, who, in the passage "Di pescatore ignobile," acquitted himself with great taste and feeling. The trio between GRISI, TAMBURINI, and MARIO, commencing "Guai se ti sfugge un moto" by their simultaneous execution was rendered one of the finest morceaux that we ever heard. TAMBURINI sang the air, "Mai per codesti insani," brilliantly. The minor part of *Maffio Orsini* was entrusted to Mdlle. E. GRISI; she acquitted herself, on the whole, well. The ballet *L'Ombre*, followed the opera. TAGLIONI was recalled on the fall of the curtain, and from the plaudits that hailed her appearance, we should say that the public by no means wish her "benefit" to be the last of her unrivalled performances. The house was full and fashionably attended.

PRINCE'S THEATRE.—The performances at this house, during the week, have been of a varied and striking character. On Monday, Spohr's beautiful opera of *Jessonda;* Wednesday, *Der Freischutz;* on Thursday, *Jessonda* was repeated; and on Friday, for the last time, *A Night in Granada.* Of these, we shall only notice the opera of *Jessonda*, as performed on Monday for the purpose of introducing Herr WILD to an English audience, in the character of *Nadori* (it having been previously represented by SCHMEZER). The injudicious puffing in the play-bill, styling him the "most renowned German singer," led us to expect more perhaps than we had a right to do; be that as it may, we are decidedly of opinion, that the manner in which he has been announced has, in a measure, been detrimental to his success. Herr WILD *has been* a singer of great ability, possessing an action graceful and essentially dramatic, and although the singer that preceded him had quite as much claim to consideration, yet, as is the case with talented singers, he infused into the character a manner peculiarly his own, although at the same time it could not be called wonderful. Herr POECK has quitted England, and his loss will be felt. He has been replaced by Herr STANDIGL, another *artiste* of considerable taste, who arrived on Wednesday. Mdme. HEINEFETTER (her third appearance) sang with a delicious freshness that was quite enchanting. She possesses a true and accurate knowledge of the essentials of dramatic representation, whilst the tones of her voice are remarkable for their fullness and roundness. The house was full, and fashionably attended.

DRURY LANE.—The *Concerts d'Eté* are proving a very serious injury to the various theatres now open; nor do we wonder at it, for they possess very powerful attractions. Among the selections of the week, there was introduced, on Tuesday, a new and very beautiful fantasia by LAFONT, descriptive of a Sailor's Dream. The first part, "setting sail," forcibly reminded us of one of WEBER'S airs in *Oberon*, descriptive of the undulating motion of the waves. It was admirably played. ELIASON and M. JULLIEN do their utmost in catering for the public, and we are rejoiced to see that they are well rewarded for it. We wish these gentlemen would be a little more refined in their movements, while "conducting" the orchestra. They resemble goats and monkeys more than they do any thing human, and throw themselves into postures that would have done honor to the art of Joe GRIMALDI in his palmiest days.

HAYMARKET.—The alternate performances of Mr. MACREADY, and Mr. Charles KEAN, are the reigning attractions here just now. We shall indeed be glad when the latter gentleman has taken his leave, for it becomes positively distressing to see him twice in any character. We are, unfortunately for ourselves, free of the establishment, but can make no use of our freedom under the circumstances. *Glencoe, Richard III., Merchant of Venice*, &c., &c., have been played *ad nauseam*, and there requires a radical change. A perpetual sameness does not give evidence of good management; nor is it fair towards the patrons of the theatre to dose them so unmercifully, night after night, with the same bill of fare. POWER, who recently took his leave before going to America, re-appears next week for eighteen nights, being "*positively*" his "last" performances before his "final" departure!!! If we called this "humbug," Mr. WEBSTER would most probably feel offended; we shall not, therefore, offer any comment upon it!

MADAME ALBERTAZZI is making a professional tour in Austria, and is now, we believe, at Vienna. She was the *prima donna* at the musical festival at Achen, a short distance from the Austriau capital, at which she sang an air from *Semiramide* and a bolero from *Malek Adel;* she never was in finer voice.

BELGIUM.—A company has been formed for conducting the Brussels theatres. Their intention is to open the *Theatre de la Monnaie*, about the 14th of August, or at least to engage, in readiness for opening at that time, a company for comic operas, comedies, dramas, and vaudevilles. They will also engage a number of dancers for *divertissements* between the acts.

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Mining Journal Office, 37, New Broad-street, City, 27th June, 1840.

NEW WORK ON THE IRON TRADE.—The Number of the MINING REVIEW this day published, contains the Sixth Part of the Paper on the IRON TRADE, by Harry Scrivenor, Esq.—this work will be completed in Twelve Monthly Parts, and so arranged as to form a separate volume at the end of the year; in addition to which the MINING REVIEW contains—A Paper on the Establishment of a School of Mines—On the Ventilation of Mines, by Samuel Moyle, Esq., C.E.—On the Preparation of China-Clay, by W. J. Henwood, Esq., F.R.S., &c.—On Blasting Limestone Rock, being an Account of Blasting the White Limestone in the Country of Antrim, Ireland, by William Bald, F.R.S.E., M.R.I.A.—On the Applicability of Peat to Manufacturing Iron—Parliamentary Returns of the Imports and Exports of Copper, Lead, and Tin, for the year ending 5th January, 1840—Scientific Bodies, &c.—The MINING REVIEW is published at the office, as above, on the 1st of each month, price Sixpence.

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By order of the Council,

July 2, 1840. J. E. B. CURTIS,

Office, 9, Villiers-street, Strand. Secretary.

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MEMOIR OF MR. JOHN COCKERILL, OF SERAING.

[The following Biographical Notice of the late Mr. John Cockerill, the distinguished Manufacturing Engineer of Seraing, is translated from the *Biographie Contemporaine*, by Count Hamal.]

John Cockerill, manufacturer of Liege, was apprenticed to his father, who made him labor as a common workman. In this manner, he passed the days of his youth at Liege. His father, Mr. William Cockerill, an English engineer, left his country about the year 1797, in the hope of making his fortune on the continent. He went first to Sweden, but not being able to effect the introduction in that country of his mechanical processes for combing and spinning wool, he repaired to Verviers in 1799. He proposed to Messrs. W. Simonis and Biolley, two of the principal manufacturers of that town, to construct for them machines for carding and spinning wool. These operations had, up to that time, been performed only by hand at Verviers, and on all other parts of the continent.

Mr. W. Cockerill's offer, which promised to produce a great saving of manual labor and time in the manufacture of cloth, was not likely to be refused by such men, who foresaw all the advantages to be derived from it. They were, therefore, eager to accept his terms, and they bound him to them by agreement, that they might possess the monopoly of his invention. Mr. W. Cockerill, who had taken his numerous family with him, was at that time in such want of money, that he stipulated in one of the clauses of the agreement that they should supply the iron, &c., that was required for the machinery.

These first carding and spinning machines, when finished and tried, worked well, and to the great benefit of those for whom they had been made. All the manufacturers of Verviers and the neighborhood quickly perceived the decided advantages to be derived from the use of these machines in the manufacture of cloth, and they successively applied to Mr. W. Cockerill to supply them with the machines at any price. In order, however, to avoid the danger of competition, he restricted the supply to the number that he could himself construct, with the assistance of his family.

As the clauses in his agreement with Messrs. Simonis and Biolley prevented him from complying with the demands of the other cloth-weavers, and foreseeing the great advantages to be derived by the construction of the machines in Verviers, Mr. W. Cockerill invited Mr. James Hodson to join him, and he gave him his daughter, Miss Nancy Cockerill, in marriage.

Mr. James Hodson, who was born at Nottingham, and whose parents were in an humble sphere of life, had left his family at the age of fifteen, for the purpose of travelling through England, and instructing himself in the mechanical arts. After a long and severe apprenticeship in different workshops in Great Britain, he settled in London, where he had contrived to set up a small manufactory, which he left in 1802 to accept the offer of Mr. W. Cockerill. The cloth manufacturers of Verviers soon gave him orders for carding and spinning machines, to enable them to compete with the houses of Simonis and Biolley, whose establishments prospered in a most astonishing manner, owing to these machines. Mr. Hodson, himself a skilful mechanic, rendered great service to the industry of Liege, by forming a great number of working mechanics, and by opening at Verviers, large and handsome establishments for the construction of machines, and for the spinning of wool. In 1817 he lost his wife, and was left a widower with six children, to whom he bequeathed at his death, which happened at Verviers, on the 10th of June, 1833, a large fortune, acquired by exertions highly beneficial to the country, and after an honorable career.

In 1807, Mr. William Cockerill went to establish himself at Liege with his son. In the first instance, he had a manufactory for the construction of wool-carding and spinning machines, and of other machinery for making cloth, at the foot of the Pont des Arches. He shortly afterwards removed his establishment to the foot of the Pont des Jesuites, where it still remains. It was in these workshops that Mr. W. Cockerill and his sons began to manufacture their various machines on an extensive scale, and in a short time they made such a quantity, that France and the principal countries of Europe were inundated with them. Nevertheless, the establishment at the foot of the Pont des Jesuites only employed 150 workmen; for a great many parts of the machines were made elsewhere, and were only sent to the manufactory to be put together and finished. Mr. John Cockerill, then scarcely 17 years of age, had the sole direction of this manufactory, without the assistance of any overseer, and the works were carried on with an unexampled degree of activity.

At this period of great prosperity in the cloth trade, Mr. W. Cockerill was making a fortune rapidly, but his reputation did not increase in the same degree. In the distribution of the decennial prizes in 1810, the jury made no mention of his name, and gave all the honors to another Englishman, named Douglas, who, having arrived on the continent after Cockerill, continued, with the assistance of the French Government, to erect manufactories even in Paris, in the island of Cygnes, where he was enabled more readily to attract public attention. Remonstrances however were made: the machines of Mr. Cockerill were submitted to a new examination, and the jury, in a supplementary report, placed the machines constructed at Liege, in workshops of Mr. Cockerill, at least on an equality, as regarded the perfection of the workmanship, with those of Mr. Douglas, and they gave him the additional merit of being the inventor. It was about this period that the elder Mr. Cockerill received from Napoleon the grant of French naturalisation. Two years afterwards, he retired from business, and his two sons, Charles James, and John, succeeded.

In 1814, after the fall of the French empire, they united their efforts, with a view to deprive England of the monopoly of the construction of steam-engines; an object of great importance to the continent, and to which Belgian industry is partly indebted for its present prosperity. The brothers Perier had, indeed, preceded them at the commencement of the present century, by making attempts at constructing steam-engines in their manufactory at Chaillott, near Paris; but their rotary steam-engines were of little practical use. It was reserved for Mr. John Cockerill to establish in Belgium, in 1815, the first manufactories where steam-engines could be constructed, possessing all the improvements that the genius of Watt had introduced, and which rendered them, in some respects, scarcely to be recognised for the same engines.

In 1816, Messrs. Charles James and John Cockerill obtained from the government of the Netherlands, possession of the chateau of Seraing, formerly the residence of the Bishops of Liege, and afterwards converted, during the French revolution, into an hospital. They established there manufactories for making steam-engines, and machines for spinning flax and carded wool, and a manufactory for refining flax also. This establishment, which was not enlarged to its full extent till the end of 1823, was, from that time, not less distinguished above all others of the kind that had previously existed in Belgium by the superiority of the machinery it produced, than by its importance.

Mr. John Cockerill, who became the sole proprietor of Seraing, by the retirement of his brother in 1819, constructed, two years afterwards, the first blast furnace worked with coke that had been built in the province of Liege. In 1822 he undertook the realisation of his extensive plans. From that time

his establishment was continually increased; but the recent improvements, which gave Seraing its present importance, seemed to be so intimately connected with the preceding works, as if from the first day the whole plan had been previously arranged and combined.

By the formation of the manufactory of Seraing, Mr. John Cockerill has exhibited the amazing extent of his genius and skill, and has become the first and the greatest manufacturer of mechanical engines in the whole world. A sketch of those establishments will give a better idea of them than any lengthened account.

FIRST DEPARTMENT—MANUFACTORIES OF MACHINERY.

	length in metres.	breadth in metres.
Building fronting the Meuse, comprising residences and warehouses	80	20
Right wing of the first yard, consisting of stables and sheds	35	12
Buildings facing the first, comprising the offices	60	14
First yard	53	35
Building of the right wing of the first yard	78	10
Building of the left wing of the first yard	78	12
Building in front of the first yard	58	22
Second yard	78	32
Building of the right wing of the third yard	115	26
Building of the left wing of the third yard	112	20
Third yard	140	12

This first division contains 125 lathes, 9 planing machines, 20 boreing machines, one for making mortices, 3 for making vices, and four circular saws. The workshop, with the great forges, contains 42 blacksmiths' forges, one mill hammer for forging large pieces of iron, and four reverberatory furnaces for heating them. The workshop for locomotives contains 11 blacksmiths' forges, and 9 others are distributed in the other workshops for their use. 25 cranes of large dimensions are fixed in these different workshops to lift up the very heavy weights.

SECOND DEPARTMENT—THE IRON WORKS.

The iron works comprise a mass of buildings of all sizes, occupying a space of 300 metres long by 230 metres broad. This second division comprises two blast furnaces for coke, two foundries, one of which is 70 metres long and 30 wide, five flatting machines, two large hammers, a large forge, 36 coke ovens, 28 ovens for heating and puddling the iron, two refining forges, 19 blacksmiths' forges, 9 lathes, and one brick making machine, put in action by a steam-engine.

The collieries form a third division. These three departments cover a superficies of 18 metrical bonniers (about 4 acres). To the left of the establishment, reaching the length of the three departments already mentioned, is the field, called the Prince's Meadow, containing 25 bonniers, which is added to their extent. This last division contains the copper manufactories, the saw-pits, and numerous magazines of wood.

Sixteen steam-engines, with a total power of 695 horses (equivalent to that of 4,885 men), are at work almost night and day to give motion to the various machines employed. The produce of the establishment, on a rough calculation, must amount to about 15 millions of francs a year. A canal from the Meuse, which terminates in a basin capable of holding fifty of the large boats that usually navigate that river, brings the goods to the centre of the establishment. A number of railroads terminate at this point; the total length of these various railways is 9,000 metres.

The number of workmen actually employed at Seraing is 2,500, but it furnishes work to a great many others not included within it. This establishment, the only directors of which have been Messrs. John Cockerill, Martin Poncelet, and Gustave Pastor, a nephew of Mr. Cockerill, has cost from its formation to the present time about fourteen millions of francs. Estimating the value of Seraing and its dependencies by the price paid for similar establishments, recently purchased in the country by the *Société de Commerce*, of Brussels, and by the Bank of Belgium, it must be worth more than sixteen millions.

The principal machines manufactured at Seraing are steam-engines, applicable to drive machinery, and also for steam-boats, locomotive steam-engines, hydraulic wheels, hydraulic presses, machinery for the transmission of motion, sugar-making apparatus, whether from beet-root or the sugar-cane, machines for the cotton manufacture, and for making bar or sheet iron, corn-mills, and a great variety of other machines used in the arts and manufactures.

In addition to the different machines and other engines, which occupied at least half of the hands on the establishment, steam-engines were constructed on an average of about 150 horses power a month, which is 1,800 horses power in a year. The most powerful steam-engines hitherto made at Seraing have not exceeded 500 horses power, but engines of 800 horses power might be made there with advantage, as all the parts have been calculated and arranged for making them of that size.

Mr. John Cockerill possesses at Liege, at the foot of the Pont des Jesuites, a large manufactory for the patterns of machines, from which all those employed in his different establishments are taken; and that manufactory alone occupies nearly 800 workmen. He possesses also, at Liege, a power-loom factory, for making merinos, as well as at Verviers and Aix-la-Chapelle; at Andennes, near Namur, he has a paper-mill and a factory for stuffs; at Cuttbus in Prussia, a manufactory of thread; at Stolberg, zinc mines; at Pezelburgh in Poland, a cloth factory; at Barcelona, a cotton factory; at Surinam, some steam mills; at Berlin and at Guben, manufactories for spinning yarns for woollen cloths; at Aix-la-Chapelle, an establishment for spinning carded wool; at Val Benoit, manufactory for stoves; at Amsterdam, an establishment for the sale of cotton stuffs; and at Spa, a cotton-spinning factory. Mr. Cockerill has also an interest in the blast furnaces of the department of Gard; in four collieries; in the blast furnaces of Ougrée, of l'Espérance, and of Chatélineau; in a musket manufactory; and at St. Denis, near Paris, in a large manufactory for spinning and weaving flax. He is now erecting, near St. Petersburgh, workshops for manufacturing steam-engines, locomotives, and carriages; and he has begun working a coal mine in the neighborhood of St. Etienne, where he purposes establishing blast furnaces, and a manufactory of iron. This list is far from comprising all the different establishments in which Mr. Cockerill is concerned. To spread industry in all directions, and to people the world with mechanics, is the mission which Mr. Cockerill conceives himself to be appointed to fulfil, and to which he has devoted his life and his fortune.

Endowed with the most valuable qualities of heart and mind, he knows how to make himself beloved by all his workmen, who look upon him as their father. He knows how to select the men he employs; to inspire them all with devotion to himself, and to identify them, in some degree, with his interests.

THE MEANS OF PROVIDING AGAINST SCARCITY OF FORAGE.

The following article on the means of providing against scarcity of food for cattle, has been recently communicated by the Central Committee of Agriculture to the *Moniteur Industriel*:—

The bad crops of grass, the anticipated scarcity of straw, owing to the continued droughts, the high price of corn, and of other food for cattle, are calculated to occasion the greatest anxiety to farmers. In these circumstances, the central committee of agriculture of the department of the Cote d'Or, has thought it right to devote several sittings to the consideration of the best means to remedy the scarcity of forage.

Among the late-sown plants which offer great advantages, maize is one of those that should occupy the first place. The green, and even the dried leaves of maize, form a food for cattle, the importance of which is not sufficiently known. When it is cut before the bursting of the male flowers, it is more liked by cattle than any other plant, and it affords them greater nourishment; therefore they ought not to be allowed to eat as much of it as they choose, for fear of accidents, especially if it has not been dried after cutting. Maize also increases the quantity of milk in cows, and gives it a fine flavor. In the south, the top part of the plants as well as the leaves, when they have not been stacked in a green state, is macerated either in pure water or water slightly salted. The stalks are broken, chopped, and moistened, and in this state they still contain seventy-four parts in a hundred of nutriment.

Maize, intended for forage, is sown thick, in the broadcast method, from the end of April to the middle of July, in small portions every fifteen days. By this means, one of the best kinds of green fodder can be procured during three or four months, without impoverishing the soil, so as to unfit it for being sown with wheat in the autumn. It requires about four hectolitres (22 gallons) of seed for every hectare (about two acres and a half). When it is intended to keep the maize for winter, it is left to wither on the ground after mowing, and it is afterwards made up into small sheaves, and hung upon supports, to complete the drying. When the maize is to be used green, it is requisite to cut it in the middle of the day, especially when the weather is hot, for it easily heats. It yields from 300 to 400 quintals of forage per hectare, and 100 kilogrammes of green fodder yields about 16 kilogrammes when it is dried.

Millet, and especially that kind called Hungary millet, produces, two months after it is sown, a fine crop of forage. It succeeds better on light and sandy soils than on calcareous lands. It requires from 10 to 12 kilogrammes of seed per hectare. The straw of millet when gathered, after it has seeded, affords also excellent food for oxen.

Buck-wheat, which, from its late vegetation, offers great advantages, should be given with caution in a green state, as it is liable to occasion dizziness, especially in sheep; it makes their heads swell, and produces pimples on their bodies. Most agriculturists have experienced the truth of these serious objections to green buck-wheat as fodder. In the departments of Soane-et-Loire, and l'Aire, however, it is used with advantage, mixed with other food, from which it would appear that its noxious properties might be removed when mixed with other plants. The buck-wheat employed as fodder, should be mown when in flower. It requires about one hectolitre and a half of seed per hectare, and the seed should not be covered with much earth.

Vetches make very good fodder. They may be sown till the end of June, but the land must not be too dry. If vetches be given green to animals in stables, the same precautions should be observed as in the use of lucerne. When it is intended to be dried, it should be cut at the time the last flowers blow, for it then contains a greater proportion of nutriment. The quantity of seed required is from 24 to 26 decalitres per hectare (a decalitre is equal to 2 gallons 1½ pints). It is advisable to sow it mixed with vetches, a few oats, and rye, it order to support it.

Lentil, which, when dried is very nourishing, has also the valuable property of resisting drought and of flourishing on very indifferent calcareous soils. Its stalks are considered preferable to the best hay. The thin climbing stalks, however, require to be supported by a little rye or oats, like those of vetches. One hectare of land requires twelve decalitres of seed.

Beans afford good fodder, whether they be cut when in flower, or after the pods are formed. The small kind, called *feverolle*, is the sort generally used for this purpose. Two hectolitres of seed per hectare, are sufficient.

Pease should be sown on fallow ground, like vetches. They are sometimes cut when in flower, but it is better to let them remain till the greater part of the pods are formed. Grey pease are peculiarly adapted for dry lands. From 24 to 26 decolitres per hectare is the quantity of seed required.

White mustard is usually sown upon the stubble, immediately after harvest. This seed, if the weather be favorable, grows quickly, and furnishes excellent nourishment for cows until the frosts come on. From eight to ten kilogrammes of seed are required for each hectare.

Barley makes very good green fodder, which is particularly suitable to animals that are tired or unwell. It also makes an equally good dry fodder. It is the same with rye; particularly midsummer rye. The latter, sown at the period of the year from which it takes its name, may be mown in autumn, then pastured till the end of winter, after which it is left to grow till spring.

Oats also produce a very abundant forage; they are particularly useful to mix with other kinds of corn. There is a mixture much used in the department of L'Aire, that is greatly recommended; it is composed of five decalitres of buck-wheat, three of spring vetches, three of oats, three of maize, and two kilogrammes of millet for every hectare of land.

Carrots, radishes, and turnips also afford abundant resources for feeding cattle. They are sown after a slight ploughing of the stubble, particularly on light and sandy soils.

The leaves of trees and shrubs, either green or dry, form excellent food for animals. After numerous experiments, it has been ascertained that leaves of the oak in a dry state, contain 80 per cent of nutriment; those of ash, 81; of elm, 81; of maple tree, 77; of acacia, 78; of beech, 72; of poplar, 76; of willow more than 80, and of birch, 72. The leaves should be gathered in August, whilst the ends of the shoots are still herbaceous. They are left for twenty-four hours in the open air, and then pressed together after being dried. If the heat be great, the leaves gathered in the morning may be carried in the evening. In the northern provinces of France, immediately after the vintage, the leaves of the vines are placed in casks with water, of which they absorb at least three centimetres (about one third). In this state, they are kept green and fresh till spring, and are much liked by cattle.

The nutritive effect of dry fodder may be greatly increased by wetting and steeping it in water. By this means, cattle will thrive equally well on two thirds of the quantity when given in a dry state. This advantage will be still further increased if the fodder be steamed. Finally, it has been long known that chopped fodder goes much farther than when given whole; and in the present state of agriculture, no means of economising the food of animals ought to be neglected.

ON THE MANAGEMENT OF REVERBERATORY FURNACES.

Heat is invisible and imponderable, like light. By its action and known phenomena, it always tends to maintain an equilibrium, which fact, no doubt, has induced chemists to consider heat as a fluid; and that the imperfection of our instruments alone, is the cause of its weight being inappreciable. To declare positively that heat is imponderable, would be to deny its existence as a fluid. Our present object, however, is not to examine the nature of heat scientifically, but only to consider its application to metallurgy.

Heat is the product of combustion; combustion is produced by the combination of oxygen with the combustible body. Nothing is more simple than this theory; but nothing is more difficult than its application. To make iron, and to work it, it is necessary to heat it; but its affinity for oxygen is so strong, that it always oxidises more or less in the different operations. The most perfect apparatus for conducting the process would, therefore, be one in which the iron could be subjected to the action of heat without bringing it in contact with oxygen; that is to say, the metal should be heated in a bath of carbonic acid gas. This is the object endeavored to be attained in employing reverberatory furnaces. These furnaces are, in fact, constructed on good theoretical principles, but, nevertheless, they are far from producing satisfactory results.

The management of a reverberatory furnace requires constant care. It is perhaps more difficult to procure men who know how to heat such a furnace, than it is to meet with good founders. The proprietors, as well as the managers of forges, neglect this essential part of the manufacture of iron; which accounts for the great difference to be observed in the quality of rolled iron. The fact is, it is as important that a reverberatory furnace should be well managed, as it is that it should be well constructed. If the grate be not kept properly supplied with fuel, the oxygen passes through without combining with the combustible, and comes in contact with the metal, and oxidises it. If the workman stirs the fire too often, the same bad effect is produced; if the coals be not stirred when necessary, they will be burnt on one side, and not hot enough on the other, and it will be impossible to keep the metal at the right temperature: if too great a heat be applied, the injury is irreparable. It will, therefore, be seen, that we had good cause to say there is no apparatus that requires more assiduous and particular attention than a reverberatory furnace. In reference to theory, we consider reverberatory furnaces as our best apparatus in making iron. They are so excellently arranged, that if they were or could be perfectly well managed, the metal could be really heated in a bath of carbonic acid gas. But the next consideration is, are these furnaces equally economical? We think not. For some time past, attention has been drawn to the means of using the heat that escapes from the mouths of blast furnaces, and yet that loss is insignificant compared with the quantity of heat lost in puddling and reverberatory furnaces. In blast furnaces, the heat is disengaged above the crucible, and passes through and acts upon all the mass with which the furnace is charged. In reverberatory furnaces, on the contrary, the heat only acts whilst passing rapidly over the metal, and the temperature is scarcely sensibly lowered when it arrives at the bottom of the chimney. The nature of reverberatory furnaces, we admit, renders a prodigious loss of heat inevitable, but the loss is increased by bad management, which we shall now point out.

As we have previously stated, heat moves like a fluid, and tends to preserve its equilibrium; it has also another property, that of radiation like light. In puddling and reverberatory furnaces, the heat is generated on a fire-place that is supplied with a current of unconfined air; a part of the radiant heat is, therefore, necessarily lost in this large uncovered space. In order to diminish as much as possible this loss of heat, it would be adviseable to enclose the fire-places, by which simple arrangement the radiant caloric would heat the air; and this heating of the air that supplies the fire, must necessarily be attended with advantage. The small coal ought also to be always thrown aside; but this is seldom done. That kind of coal is not only of no use when thrown into the furnaces, but it prevents the regular burning of the fire, and only tends to choke it. The air being prevented by it from passing through in sufficient quantity, the coal is distilled, and the hydrogen gas escapes without being burnt. The temperature is by this means immediately lowered, and the stoker stirs the fire to rake out the small coal, which is thus lost, after having produced the injurious effects we have mentioned.

The proper arrangement of the fire-places, the sifting out of the small coal, and intelligence and zeal in the management of the furnaces, are the points to which the attention of masters and managers of forges ought to be directed, until a complete reform is introduced in our iron manufactures.—*L'Ancre.*

RISE IN THE PRICE OF SUGAR.

We see by a Leeds paper, that the grocers of that town held a meeting last week, and raised the price of sugar one penny per lb. More sugar is required at this time for the preservation of fruit, than at any other period of the year. The crop, too, of such fruit as is generally preserved by sugar, is, we believe, unusually abundant, and much of it will probably be spoiled or wasted by the dearness of sugar and shortness of the supply. Now this must be a great injury to many persons; and those who have families, or who have seen in country-houses the many grateful uses to which preserved fruit is applied, will feel and regret the loss of winter puddings and winter dessert, which will be caused by the present dearness of sugar.

We hope the landowners and farmers will especially notice how they will be injured by this. At present, the fruit-growers of Kent, Sussex, Middlesex, Surrey, &c., &c., have petitioned the Legislature for a higher protecting duty than they at present enjoy. Now if sugar was cheap, and fruit could be cheaply preserved, they would get a better price for their rapidly perishable production, and home-grown preserved fruit would enter more into competition with the dried fruits which are imported towards the winter. The want of sugar will therefore cause in winter an increased consumption of raisins and currants, while the fruit-growers will now get a very low price for their cherries, currants, gooseberries, and raspberries. So injustice, began by the landlords, and supported by the farmers countenancing one another, works back on themselves, and drains their own pockets, or blights their own hopes.

We apprehend that the price of sugar has not reached its maximum. A correspondent at Liverpool informs us, that the stock in hand now of our colonial sugar is 25,270 tons less than last year, while the whole of the foreign sugar in the kingdom is only 12,890 tons, or about half enough to supply the deficiency. In 1839, the quantity of our colonial sugar imported into London, Liverpool, Bristol, and the Clyde, was 88,480 tons; in 1840 it was only 72,920. The deliveries at the same ports in the former year, 82,980 tons; in 1840, 96,660 tons; showing, by a comparison of the imports and deliveries of the two years, a larger deficiency, namely, of 29,240 tons, in 1840, than is shown by comparing the stock. With this short supply, and the price of West Indian brown sugar at 60s. at Liverpool, while foreign can be bought at 21s. or 22s., the reader will not be surprised to learn that the high protecting duty, said by Mr. M'Culloch to amount to a prohibitory duty, has been paid on some foreign sugar. The monopoly price is so exorbitant, that the difference of duty, no less than 39s. the cwt., is not equal to it, and foreign sugar can pay the difference, and be brought in for home consumption. We may state, therefore, that now 40s. at least per cwt. is the sum levied by the planter's monopoly, which Mr. O'Connell and Dr. Lushington are so desirous to uphold, on the sugar consumed by the people of England.—*Sun.*

Antarctic Expedition.—Wednesday afternoon, about 5 o'clock, the fast-sailing schooner Eliza Scott, Captain Mapleton, R. N., sailed down the river on her voyage of discovery to the Antarctic Sea. Her appointments, fittings up, and instruments, are upon the most approved scientific principles. This beautiful schooner follows in the wake of Captain Ross and Captain D'Urville, of the French Marine. Captain Mapleton's nautical talents have long been a theme of deserved praise by all those who know him.

EXPIRED PATENTS.

PATENTS THAT HAVE EXPIRED DURING THE WEEK ENDING JULY 4, 1840.

ENGLAND.

LEWIS AUBREY, of Two Waters, in the county of Herts, engineer, for *an improvement or improvements in the web or wire for making paper*, July 4.

JOHN POOLE, of Sheffield, shopkeeper, for *improvements in steam-engine boilers or steam generators, applicable also to the evaporation of other fluids*, July 4.

DANIEL FREEMAN, of Wakefield, saddler, for *improvements in measuring for, and making collars for horses and other cattle*, July 4.

PETER GROVES, of Liverpool-street, London, Esq., for *improvements in manufacturing and making white lead*, July 4.

ROBERT WORNAM, of Wigmore-street, Cavendish-square, pianoforte-maker, for *improvements in pianofortes*, July 4.

SPECIFICATIONS.

A LIST OF SPECIFICATIONS ENTERED AT THE ENROLLMENT OFFICE, UP TO THE WEEK ENDING JULY 4, 1840.

(*Continued from page* 3.)

ENGLAND.

CHARLES COWAN, of Peniwick, in the county of Edinburgh, paper manufacturer, and ADAM RAMAGE, of Valley Field, in the same county, paper-maker, for *improvements in the machinery used in the manufacture of paper*, July 3.

A disclaimer is entered with this specification, wherein the inventor only claims an *improvement*, in place of *improvements*.

The claim is for the method of using a drum-wheel covered with wire, whereby the water may be conveyed from the pulp. The drum-wheel has therein scoops or buckets, which collect the water as it passes through the interstices of the wire, and raise it above the centre of the axis, when, by its gravity, it descends into the hollow axis, and flows out at one end.

The improvement which no doubt was disclaimed, is for placing in parallel positions a number of iron or metal bars, with cutting edges, round a cylinder or drum, so that the circumference of the same shall become concentric with the axis. Steel nibs are placed in juxta-position with this cylinder that revolves in the pulp, by which means the rags and knotty particles, in passing between this cutting space, become divided, comminuted, and intermixed.

CHARLES GREENWAY, of Douglas, in the Isle of Man, *certain improvements in reducing friction in wheels of carriages, which improvements are also applicable to bearings and journals of machinery*, July 3.—The first claim consists in the method of forming a "cradle" for the reception of spheres or rollers, near to which, the arm of the axle is made to rotate, whereby a considerable friction is overcome, as the spheres or rollers do not require an axis, and the cradle is so formed as to keep them close to the axle.

In the description of the second improvement, the inventor states that to the carriage, on which the trunnions of a caronnade are usually fixed, wheels are not used, in order to prevent recoiling. But in his improvement, wheels are put to the carriage, so as to facilitate the movement of the caronnade towards the port-hole or embrasure; and before the act of firing, the caronnade with its trunnion is moved by the action of a lever from the carriage on to the deck of a vessel to prevent recoiling, and is again restored to the carriage by the same lever, when preparing to reload.

ENTERED AT THE ROLLS CHAPEL OFFICE, UP TO THE WEEK ENDING JULY 4, 1840.

(*Continued from No.* 48.)

ENGLAND.

SAMUEL and JOHN LAWSON, of Leeds, engineers and co-partners, *improvements in machinery for spinning, doubling, and twisting flax, wool, silk, cotton, and other fibrous substances*, July 1.—The claim is for the general arrangement and construction of throstle, twisting and doubling frames, or machinery of this class, whereby two sets or rows of spindles, bobbins, and flyers, placed at equal distances from the perpendicular line, drawn from the nip or point of contact of the lower drawing rollers, are made to act in conjunction with one set of drawing rollers, and in such manner that the two threads or yarns in spinning, or the two pairs or more of yarns or threads in doubling and twisting, shall have equal tension, strain, or drag.

The yarn from the bobbins or spools above, passes over longitudinal rods, and under a lower rod that is fixed in a water-trough, which is not used in spinning cotton; it then passes over the smooth edges of the trough, and unites again in a diagonal direction over another roller below, whence it is conveyed between drawing rollers (driven by a train of toothed wheels) on to the guide, and passes through the eyes at the end of flyers, which cause the yarn to be twisted or doubled.

The copping rail, or lifter, is worked by a lever and heart-wheel.

JOHN LEO NICHOLAS, Clifton, Bristol, *certain improvements in the method of constructing and propelling carriages on railways or common roads, and through fields, for agricultural purposes*, July 1.—The inventor first claims the method of propelling carriages by means of legs, and working them by arms or other similar apparatus, mounted on a shaft, and actuated by a motive power. Vibrating levers are weighted at one end, the other end has a joint with a pending lever, or leg, with a shoe attached thereto. As the discs with radiating arms are made to revolve, the levers or legs are actuated so as to press against the ground and propel the carriage forwards, either up hill or on a level.

Second claim is for the method of constructing, applying, and using moveable railways or platforms, whilst travelling over bogs or other marshy grounds; such moveable platforms, consisting of a number of unconnected boards, which are raised up behind, and are carried along the side of the carriage, and then let down in front.

Third claim is for the method of working the steam-stop or slider of the rotary-engine, and also the manner of effecting the reverse motion of the engine, by means of an extra set of valve boxes, each box being furnished with a double set of valves, which may be instantly brought into, or put out of action by the hand of the engineer.

A shaft, with radial arms, is fixed in the centre of an inner cylinder, placed within an outer cylinder, and running concentric therewith, whereby an annular space is formed between the two. Stops or slides are made to work in this space, where steam is admitted, and presses round the piston that is attached to the outer surface of the inner cylinder. The waste steam, in passing off, works a reciprocating engine, which gives an alternate action to the slides or stops; hence, the steam has its bearing against one stop, while the other is rising to make way for the piston. The reversing action is simply to alter the induction of the steam into the valve box.

NOTICE.

In accordance with the determination expressed in our 26th Number, of giving one month's clear notice to Inventors, before publishing their specifications, we hereby inform the following Patentees, that their specifications will be published in the "INVENTORS' ADVOCATE" of August 15. Each party will receive, in addition, a *private* communication to the same effect.

Croft William Moat, of Thistle-grove, Brompton, due August 5.
Wilkinson and Patrick S. Steele, manufacturing and furnishing ironmongers, due August 5.
William Isaac Cookson, of Newcastle-upon-Tyne, due August 5.
Thomas Myerscough, of Little Bolton, and William Sykes, of Manchester, machine-maker, due August 5.
Samuel Carson, Caroline-street, Coleshill, Eaton-square, due August 5.
Joseph Needham Tayler, R. N., Plymouth, due August 8.
John Wertheimer, West-street, Finsbury-circus, printer, due August 8.
Robert Beart, Godmanchester, Huntingdon, miller, due August 8.
Amand Deplanque, Leicester-square, due Aug. 8.
Edmund Rudge, jun., Tewkesbury, tanner, due August 8.
James Hancock, Gloucester-place, Walworth, due August 8.
George Eugene Magnus, Manchester, merchant, due August 8.

BRITISH PATENTS.

AN ALPHABETICAL LIST OF BRITISH PATENTS, GRANTED FROM JULY 1ST TO DEC. 31ST, 1830.

(*The Year Continued from No.* 48.)

Agricultural implements,—see Locomotive, &c., C. J. H.
Air into fluids for evaporation, Oct 20, Fancett, W.
Air-stove apparatus for exhalation and condensation of vapors, Oct. 20, Ure, A.
Anchors, Oct. 6, Perring, R.
Apparel for dress, ornaments, &c., Aug. 5, Hancock, T.
Apparatus for regulating temperature in evaporating, distilling, &c., Oct. 20, Ure. A.
Apparatus for rudders of ships, Nov. 1, Collinge, J.
Apparatus,—see Carriage, W. P.
Arithmetic taught by an apparatus, Nov. 13, Tyrrell, J.
Axletrees and boxes, Aug. 24, Mason, W.
Balsam for coughs, &c., Aug. 12, Ford, T.
Baths,—see Shower, &c., B. J. L.
Battering-ram for coal mines, Dec. 23, Wood, W.
Bits for horses, &c, July 6, Surman, J.
Blasts to furnaces,—see Rotary motion, S. J.
Block supporter used in docks, Aug. 5, Clough, R.
Boats, ships, carriages, Sept. 21, Church, W.
Boilers, &c., July 19, Taylor, W.
Boilers,—see Steam carriages, B. J.
Boxes,—see Axletrees, M. W.
Bread-making machine, Aug. 31, Clayton, E.
Brewing and distilling, Aug. 5. Coffey, Æ.
Bricks, tiles, &c., Aug. 18, Bakewell, S. R.
Bricks, tiles, &c. Sept. 13, Chadley, J.
Candle-making, Aug. 10, Palmer, W.
Carriage, apparatus for locking the wheels and liberating the horses, Sept. 7, Williams, P.
Carriages,—see Boats, ships, C. W.
Carriages,—see Locomotive, C. J. H.
Carriage-wheels, Aug. 5, Pearse, J.
Chairs, Nov. 9, Minter, G.
Chimney improvements, Sept. 14, Smith, S.
Cleansing wheat, &c., July 6, Tuxford, W. W.
Coal, prepared, for refining sugar, Dec. 23, Pertins, M. E.
Coal,—see Battering-ram, W. W.
Cocks for kitchen ranges and cooking apparatus, Sept. 7, Cook, W.
Cocks or taps, Dec. 13, Vardy, J.
Condensing,—see Air stove, U. A.
Cooking apparatus,—see Cocks, C. W.

Copper and metals from corroding, Nov. 4, Bompas, G.
Corroding,—see Copper, B. G.
Corrosion,—see Iron cables, &c., R. J.
Coughs,—see Balsam.
Cutting timber into veneers, &c., Oct. 20, Craig, A.
Distilling,—see Apparatus, U. A.
Distilling.—see Brewing, C. Æ.
Docks,—see Block, C. R.
Dyeing hats. Nov. 1, Bowler, J.
Earth,—see Excavating, M. T.
Engine for mechanical purpose, July 24, Ericsson, J.
Evaporating fluids, Nov. 6, Gibbs, J.
Evaporating,—see Apparatus, U. A.
Evaporating,—see Propelling, C. W.
Evaporating,—see Air into fluids, F. W.
Excavating, &c. earth, Oct. 20, Cochrane, Sir T.
Exhalation,—see Air-stove, U. A.
Fermenting malt, &c , July 19, Riley, E.
Fid for vessels, Sept. 7, Gardner, R. and J.
Fire-arms, &c., Dec. 17, Redfern, B.
Fire-arms,—see Nipple and primer, S. S.
Fire-escape, &c., Oct. 6, Walker, Lt. Col.
Furnaces, Nov. 4, Nott, J. B.
Gas-lighting, &c., Oct. 6, Donovan, M.
Gas-making, Aug. 5, Down, J.
Gas-meter, Oct. 20, Clegg, S.
Girths,—see Saddle cloths, C. S.
Girths,—see Saddles, L. J.
Glass or emery paper, substitute for, Dec. 6, Edwards, R.
Glazing outhouses and buildings, Oct. 6, Curtis, R. G.
Grain,—see Quarries, P. H.
Grass plots, cropping or shearing, Aug. 31, Budding, E.
Guns and fire-arms, Dec. 7, Davis, S.
Hooks,—see Tackle, S. J.
Hop-pole, drawer, &c., Aug. 12, Knowles, J.
Iron cables, boilers, &c. from corrosion, Nov. 27, Revere, J.
Lamps, Dec. 13, Parlour, S.
Life-boat, &c., Aug. 5, Dobree, W.
Locomotive carriages, Aug. 31, Hanson, J.
Locomotive carriages, &c., Nov. 4, Parker, R.
Locomotive engines, Sept. 7, Ericsson, J.
Locomotive ploughs, harrows, carriages, &c., July 1, Clive, J. H.
Looms, July 1, Sadler, J. H.
Malt,—see Fermenting, R. E.
Metallic substances for sheathing ships, July 6, Uzielli, M.
Navigating vessels and propelling carriages, Aug. 5, Ruthven, J.
Nobs or slots for cylinders in printing calicoes, &c., Nov. 1, Cook, B.
Nipple and primer for fire arms, Aug. 7. Smith, S.
Oil, extracting, from seeds,&c ,Dec. 6, Blundell, H.
Ornaments,—see Apparel, H. T.
Packing and transporting goods, Aug. 5, Dance, Sir C.
Painting brushes, &c., Oct. 20, Mason, T.
Paper-cutting, Nov. 1, Aubrey, L.
Paper-making, Aug. 31, Barratt, T.
Paper-making, Oct. 6, Dickenson, J.
Paper-making, Nov. 9, Hall, J.
Paper-making machine, July 29, Ibotson, R.
Plating or coating copper, &c., July 26, Roberts, S.
Pressing,—see Printing, N. D.
Printing and pressing machine, Oct. 13, Napier, D.
Printing calicoes, &c., Dec. 6, Dalglish, R.
Printing calicoes, &c.—see Nobs, C. B.
Printing machines, July 19, Cowper, E. and E.
Printing machines, Aug. 31, Applegath, A.
Propelling boats, &c., and evaporating, Nov. 29, Church, W.
Propelling carriages,—see Navigating, R. J.
Propelling carriages, vessels, Dec. 13, Witty, R.
Propelling machine, Aug. 18, Gubbins, Major-Gen.
Propelling,—see Steam-engines, H. J. W. G. and R.
Propelling vessels, &c., July 19, Bulkeley, T.
Quarries manufacturing, for drying grain, Nov. 11, Pratt, H.
Rice, preparing and cleansing, Aug. 5, Shiels, C.
Rotary-engine, Nov. 11, Coehrane, Sir T.
Rotary motion, &c., for producing blasts to furnaces, Aug, 5, Street, J.
Rudders,—see Apparatus, C. J.
Saddle-cloths and girths, Oct. 20, Clerk, S.
Saddles, &c., Oct. 26, Calvert, H.
Saddles and girths, Aug. 10, Lawrence, J.
Saddle, self-adapting, Sept. 7, Thacher, T.
Sheathing,—see Metallic, &c., U. M.
Ships, &c., raised up from the water, and moving ships on land, Dec. 6, Brown, S.
Shower and other baths, Dec. 13, Benham, J. L.
Size to paper, Aug. 18, Smith, L.
Skins,—see Wool, &c., B. A.
Spinning, doubling, &c., Dec. 13, Needham, W.
Spinning, &c. cashmere wool, Nov. 13, Cochrane, C. S.
Spinning, &c. rendered self-acting, July 1, Roberts, R.
Spinning machines, Nov. 18, Sands, T.
Spinning or working cotton, &c., Dec. 13, Walmsley, T.
Spinning, roving, &c., Aug. 5, Lane, W.
Spinning, roving, &c., Sept. 21, Bunday, W.
Springs for carriages, Dec. 17, Graham, A.
Steam-carriages and boilers, July 19, Boase, J.
Steam-engines for propelling carriages, &c., Oct. 6, Heaton, J. W. G. and R.
Sugar-cleansing, &c., Oct. 20, Ure, A.
Sugar-making, July 24, Garnett, A.
Sugar-making, Oct. 13, Archbald, W. A.
Sugar-making, &c., Aug. 5, Robinson, M.
Sugar-making, &c., Sep. 29, Derosne, C.
Sugar,—see Coal prepared, P. M. E.
Tackle and other hooks, Nov. 1, Shores, J.
Tanning, &c., Oct. 20, Jacquemort, F. C.
Transporting goods,—see Packing, D., Sir C.
Veneers,—see Cutting, C. A.
Wheat,—see Cleansing, T. W. W.
Wheel-barrow, Aug. 5, Mallet, W.
Wheels for railway carriages, Aug. 31, Losh, W.
Wheels to carriages, Nov. 4, Gillett, A. W.
Woollen cloths, shearing, &c., July 22, Oldland, G.
Wooollen cloth, preparing the pile, Dec. 23, Ferrabee, J.
Woollen cloths, roughing or dressing, Dec. 23, Papps, D.
Wool or hairs removed from skins, Nov. 4, Bell, A.

BRITISH PATENTEES.

AN ALPHABETICAL LIST OF INDIVIDUALS WHO HAVE TAKEN OUT PATENTS IN ENGLAND, FROM JULY 1ST TO DEC. 31ST, 1830.

(The Year Continued from No. 48.)

Applegath, Augustus, Printing machines, Aug. 31.
Archbald, William A., Sugar-making, Oct. 13.
Aubrey, Lewis, Paper-cutting, Nov. 1.
Bakewell, Samuel R., Bricks, tiles, &c., Aug. 18.
Barratt, Thomas, Paper-making, Aug. 31.
Bell, Alexander, Wool or hairs removed from skins, Nov. 4.
Benham, John L., Shower and other baths. Dec. 13.
Blundell, Henry, Oil, extracting from seeds, &c. Dec. 6.
Boase, John, Steam carriages and boilers, July 19.
Bompas, George, Copper and metals from corroding, Nov. 4.
Bowler, John, Dyeing hats, Nov. 1.
Bramley, Thomas,—see Parker, Robert.
Brown, Samuel, Ships,&c., raised up from the water, and moving ships on land, Dec. 6.
Budding, Edwin, Grass plots, cropping or shearing, Aug. 31.
Bulkeley, Thomas, Propelling vessels, &c., July 19.
Bunday, William, Spinning, roving, &c., Sept. 21.
Calvert, Henry, Saddles, &c., Oct. 26.
Chadley, James, Brick, tiles, &c., Sept. 13.
Church, William, Boats, ships, carriages, Sept. 21.
Church, William, Propelling boats, &c., and evaporating, Nov. 29.
Clayton, Edwin, Bread-making machine, Aug. 31.
Clegg, Samuel, Gas-meter, Oct. 20.
Clerk, Samuel, Saddle-cloth and girths, Oct. 20.
Clive, John H., Locomotive ploughs, harrows, carriages, &c., July 1.
Clough, Robert, Block supporter used in docks, Aug. 5.
Cochrane, Charles S., Spinning, &c. cashmere wool Nov. 13.
Cochrane, Sir T., Excavating, &c. earth, Oct. 20.
Cochrane, Sir Thomas, Rotary engine, Nov. 11.
Coffey, Æneas, Brewing and distilling, Aug. 5.
Collinge, John, Apparatus for rudders of ships, Nov. 1.
Cook, Benjamin, Nobs or slots for cylinders in printing calicoes, &c., Nov. 1.
Cook, William, Cocks for kitchen ranges and cooking apparatus, Sept. 7.
Cowper, Edward and Ebenezer, Printing machines, July 19.
Craig, Alexander, Cutting timber into veneers, &c., Oct. 20.
Curtis, Richard G , Glazing outhouses and buildings, Oct. 6.
Dalglish, Robert, printing calicoes, &c., Dec. 6.
Dance, Sir Charles, Packing and transporting goods, Aug. 5.
Davis, S., Guns and fire-arms, Dec. 7.
Derosne, Charles, Sugar-making, &c., Sept. 29.
Dickenson, John, Paper-making, Oct. 6.
Dixon, John,—see Vardy, James.
Dobree, William, Life-boat, &c.. Aug. 5.
Donovan, Michael, Gas-lighting, &c., Oct. 6.
Down, James, Gas-making, Aug. 5.
Edwards, Richard, Glass or Emery paper, substitute for, Dec. 6.
Ericsson, John, Engine for mechanical purpose, July 24.
Ericsson, John, Locomotive engines, Sept. 7.
Faucett, William, Air into fluids for evaporation, Oct. 20.
Ferrabee, John, Woolleu cloth, preparing the pile, Dec. 23.
Ford, Thomas, Balsam for coughs, &c , Aug. 12.
Gardner, R. and J., Fid for vessels, Sept. 7.
Garnett, Abraham, Sugar-making, July 24.
Gibbs, Joseph, Evaporating fluids, Nov. 6.
Gillett, Augustus W., Wheels to carriages, Nov. 4.
Graham, Augustus, Springs for carriages, Dec. 17.
Gubbins, Major-General, Propelling machine, Aug. 18.
Hall, John, Paper-making, Nov. 9.
Hancock. Thomas, Apparel for dress, ornaments, &c., Aug. 5.
Hanson, John, Locomotive carriages, Aug. 31.
Harrison, Joseph,—see Curtis, Richard G.
Heaton, J.W. G. and R., Steam-engines for propelling carriages, &c. Oct. 6.
Ibotson, Richard, Paper-making machine, July 29.
Jacquemort, Francois C., Tanning, &c., Oct. 20.
Knowles, John, Hop-pole drawer, &c., Aug. 12.
Lacy, John G.,—see Davis, S.
Lane, William, Spinning, roving, &c., Aug. 5.
Lawrence, John, Saddles and girths, Aug. 10.
Losh, William, Wheels for railway carriages, Aug. 31.
Mallet, William, Wheel-barrows, Aug. 5.
Mason, Timothy, Painting brushes, &c., Oct. 20.
Mason, William, Axletrees and boxes, Aug. 24.
Minter, George, Chairs, Nov. 9.
Molyneux, Francis,—see Bunday, William.
Napier, David, Printing and pressing machine, Oct. 13.
Needham, William, Spinning, doubling, &c., Dec. 13.
Nott, Joel B., Furnaces, Nov. 4.
Oldland, George, Woollen cloths, shearing, &c., July 22.
Palmer, William, Candle-making, Aug. 10.
Papps, Daniel, Woollen cloths, roughing or dressing, Dec. 23.
Parker, Robert, Locomotive carriages, &c., Nov. 4.
Parlour, Samuel, Lamps, Dec. 13.
Pearce, Henry, G.,—see Gardner, R. and J.
Pearse, John, Carriage-wheels, Aug. 5.
Perring, Richard, Anchors, Oct. 6.
Pertius, Marie E., Coal prepared for refining sugar, Dec. 23.
Pratt, Henry, Quarries, manufacturing, for drying grain, Nov. 11.
Raive, John,—see Boase, John.

Redfern, Bartholomew, Fire-arms, &c., Dec. 17.
Revere, John, Iron cables, boilers, &c., from corrosion, Nov. 27.
Riley, Edward, Fermenting malt, &c, July 19.
Roberts, Richard, Spinning, &c. rendered self-acting, July 1.
Roberts, Samuel, Plating or coating copper, &c. July 26.
Robinson, Marmaduke, Sugar-making, &c., Aug. 5.
Rudder, William,—see Lawrence, John.
Ruthven, John, Navigating vessels and propelling carriages, Aug. 5.
Sadler, John H., Looms, July 1.
Sands, Thomas, Spinning machines, Nov. 18.
Sharp, Joseph B.,—see Faucett, William.
Shiels, Rice C., preparing and cleansing, Aug. 5.
Shores, Jeffery, Tackle and other hooks, Nov. 1.
Smith, Leapridge, Size to paper, Aug. 18.
Smith, Samuel, Nipple and primer for fire-arms, Aug. 7.
Smith, Seth, Chimney improvements, Sept. 14.
Street, John, Rotary motion, &c., for producing blasts to furnaces, Aug. 5.
Surman, John, Bits for horses, &c., July 6.
Taylor, William, Boilers, &c., July 19.
Thacker, Thomas, Saddle, self-adapting, Sept. 7.
Towgood, Matthew,—see Smith, L.
Tuxford, William W., Cleansing Wheat, &c., July 6.
Tyrrell, John, Arithmetic taught by an apparatus, Nov. 13.
Ure, Andrew, Air-stove apparatus for exhalation and condensation of vapors, Oct. 20.
Ure, Andrew, Apparatus for regulating temperature in evaporating, distilling, &c., Oct. 20.
Ure, Andrew, Sugar, cleansing, &c., Oct. 20.
Uzielli, Matthew, Metallic substances for sheathing ships, July 6.
Vardy, James, cocks or taps, Dec. 13.
Vignoles, Charles B.,—see Eriesson, J.
Walker, Lieut.-Col., Fire-escape, &c., Oct. 6.
Walmsley, Thomas, Spinning or working cotton, &c., Dec. 13.
Williams, Peter, Carriage apparatus for locking the wheels and liberating the horses, Sept. 7.
Witty, Richard, Propelling carriages, vessels, Dec. 13.
Wood, William, Battering ram for coal mines, Dec. 23.

FOREIGN CORRESPONDENCE.

FRANCE.

THE COMMERCIAL TREATY BETWEEN ENGLAND AND FRANCE.

The *Constitutionnel*, to which many persons have looked with some anxiety for explanations on the subject of the commercial negotiations with England, is still silent, probably because it considers that as these negotiations were intended to be, and indeed ought to have been, secret up to the moment of completion, any allusion to statements derived from private sources would be indiscreet and improper.—The *Courrier Français*, however, as will be seen by an extract in another part of the *Messenger*, returns to the question, and, in correcting the statement of the *Debats*, corrects to a certain extent its own statement which gave rise to the remarks of other journals. According to the *Courrier* the only difficulty of a nature at all serious is that respecting the duties on English pottery, and it now considers the treaty as virtually concluded. If this view of the affair be correct, either M. Thiers has not interposed the obstacles mentioned by the *Debats*, or her has abandoned them. The *Commerce* has an article on the subject, which, without pretending to any knowledge of the real cause of the difference—for that there is a difference even the *Courrier* still admits—contains some passages which are interesting, as being another instance of the great change which public opinion in France has undergone as to the prohibitive system. It is a fact well worthy of notice, that the press is now all but unanimous as to the necessity of important modifications in this system. It is not, therefore, presuming too much to expect that, although the completion of the treaty may still be delayed, it will eventually take place, and prove the foundation of more intimate commercial relations between the two countries—a result which appears to be ardently desired by the partisans of the English and French alliance, as they appear to consider a more free and extensive commercial intercourse to be the surest guarantee of a durable political understanding. The *Commerce* says—

"Everybody, and even M. Thiers, must know that the *statu quo* is favorable to England, and contrary to French interests. England, under the influence of a duty of about four per cent., continues to impose a large quantity of linen thread upon our markets. Formerly we scarcely received any; she now sends us to the amount of from 15,000,000 to 20,000,000 annually. Whilst the existence of so slight a duty has enabled England to find such extensive sale in our markets, France has, on the contrary, seen the exportation of her principal products constantly diminishing. If we look, for instance, at what took place during the year 1839, we shall see that the importation of thread in France amounted to from 58,000 to 68,000 metrical quintals (from 12,847,000 to 15,062,000 lb); whilst, on the contrary, our exports in wines fell from 2,453,000 hectolitres to 1,193,000, and those of brandy from 206,000 hectolitres to 154,000. These facts are significative; they show how the duties on thread in France, and those on wines and brandies in England, operate to our injury, and the necessity of avoiding all further delay in a treaty, which is destined to modify duties which are so onerous to us."

It will be seen by the above extract that the *Commerce* treats the subject on the basis of self-interest, which is the best mode of preparing the public mind in France for changes, but it is not the less conclusive in favor of the reciprocity system. It adds—

"The various rumors current on the subject of these negotiations prove that M. Thiers is much pre-occupied with the concessions which we are making upon certain articles. This does not surprise us, for M. Thiers belongs to the prohibitive school, and treats all foreign articles as enemies. This is a very narrow view, and unworthy of a statesman. What ought to strike the President of the Council is the amount of advantage secured to us by the concessions which we make to our neighbors. One principal object, evidently, is to recover the consumption which our wines and brandies formerly had in England. Has M. Thiers examined carefully whether the reduction of duties agreed to by England is calculated to attain this object? The principal vice of the treaty of 1786, which has been so severely censured, was its not having stipulated for sufficiently favorable conditions for our wine-growers. At present, the reduction of duties agreed to by England will not produce really advantageous results, unless it be so extensive as to render the use of French wines general in the United Kingdom. We have to contend against the strong wines of Portugal, the taste for which has been so much increased by the fatal Methuen treaty. England must repair the evil which she has inflicted upon us."

In the French Academy of Sciences, on Monday, M. Regnault was elected a member in the section of Chemistry, in the room of M. Robiquet. Captain Parry was also elected a corresponding member of the section of Geography and Navigation, in the room of M. Krayenhoff.

BELGIUM.

TRANSATLANTIC STEAM-SHIPS.

In the discussion in the Senate, of the project of law relative to the Transatlantic steam-ships, the Minister of the Interior, in answering a question respecting the intentions of the government in the construction of the engines of those ships, openly stated that it appeared to him to be dangerous to engage to confine the manufacture of them to Belgian engineers. He referred, in confirmation of this opinion, to what had occured even in France, where M. Thiers refused to make a similar promise, though there are in that country large manufactories of marine steam-engines, and where the government have an excellent manufactory of the kind. M. Leidts added, "If we could be certain that the engines could be made as well in Belgium as in England; if the manufacturers would guarantee the power and the quickness of their engines and machinery, without doubt we should desire to see them made in this country; but though they willingly agree to guarantee the strength of their engines, they hesitate to guarantee the speed to be attained, and yet that is an essential condition to the success of the undertaking."

An interesting discovery has been made in a carboniferous mountain at Creysselles, near Prevas, in the department of Ardèche, of a substance that has been called *tripolienne*. It is extremely white, easily crumbles, and contains no particles that can scratch the surfaces to which it is applied. A pinch of it will *frost* gold, silver, copper, tinned iron plate, and all other metallic substances. This discovery has been submitted to the Academy of Sciences.

Five large merchant ships, two of which are Swedes, one American, and two French, are taking in cargoes of charcoal at Toulon for La Plata.

It appears that the sculptor who is at work on the statue of Rubens, cannot complete it in time for the proposed inauguration in August next. It is not yet decided whether the proposed fêtes shall be adjourned till next year, or whether they shall be celebrated in some manner at the time fixed, without the ceremony of inauguration.

The projected canal from the Marne to the Aisne, which has been agreed to by the French Chambers, is expected to be greatly beneficial to the province of Hainault, and calculated to produce a complete change in the manufactures of metal in Upper Champagne. At present all the coals for those manufactories are supplied from St. Etienne, but when the canal is completed they can be much more conveniently and cheaply obtained from the provinces of Hainault and Liege.

Brussels, July 3.—A letter from Brussels of the 30th of June, addressed to the *Avondbode*, says—"The Minister of the Interior has been for some time engaged on the project of a treaty of commerce between Holland and Belgium, which the Prince de Chimay is to propose to the Government of the Hague. The Dutch Government appears likewise to have taken some steps to settle the preliminaries of a commercial treaty between the two countries. The principal articles on which Belgium asks a reduction of the import duties, are, woollen cloths, linen, plain and printed calicoes, carpets, lace, iron, mirrors, works in bronze, cutlery, arms, hewn stone, and, above all, coals. On the other hand, Belgium would reduce the duties on all productions of the Dutch colonies, as well as on cattle and cheese."

COMMERCE IN AFFGHANISTAN.

It must gratify every Englishman to learn, that the effect of our triumphs in Affghanistan is not limited to the mere establishment of respect for the military qualities of our soldiery, and the skill of our diplomatists. Confidence in our moral integrity, and a thorough conviction of the security of property in all places, wheresoever our power may extend, has, we understand, given a wonderful stimulus to commerce in Affghanistan—thus, as it were, identifying British influence with the happiness and prosperity of the people, and raising up a formidable moral barrier against northern schemes and encroachments. Nor is the benefit of our pro-

tection confined entirely to the traders of the country. Our own manufactures are finding a new channel of consumption, to the entire supercession of the wretched Russian wares, with which the Affghans have hitherto been obliged to put up, and there can be no doubt that, in proportion as the facilities of navigation on the Indus are improved, and the security in the passes and on the desert established, the imports from Bombay and the North-west Provinces will very materially augment, and tell with prodigious effect upon the revenues of the government. The following is an extract from a late letter from Candahar, conveying the gratifying information we have referred to:—

"Since our arrival here, the whole town has changed its appearance, and shops are being opened daily in every corner. The commerce of the country also has increased greatly, and there are Kafilas (caravans) arriving constantly from Bokhara, Herat, Cabool, Bombay, Cashmere, and Peshawar, with merchandise of all kinds, particularly clothes, shawls, and silk soojarees beautifully worked, and Herat carpets of all kinds, some so well made that they feel like velvet. All the chintzes, cloth, broad cloths, &c. now come from Bombay, and merchants are continually going backwards and forwards. When we first arrived, nearly every thing was of Russian manufacture, but the market now appears to be altogether supplied with English goods. The country is quite settled for miles around Candahar, and we can go to any distance with the greatest safety."

And this is written within a twelvemonth of our arrival! What tale shall we be able to tell five years hence, when the whole country from Shikarpore to the Hindoo Khosh has fallen under our sway (for of course we regard Shah Soojah as a mere puppet)—when the Affghan soldier has bent himself to British discipline, as a compensation for the hitherto unknown luxury of *regular pay*,—when the merchant is exempted from the rapacious tax of the Beloochee and the Ghilzie, and the villager tills his land, gathers his fruit, and tends his cattle, undisturbed by predatory visitations, the exactions of the *soi-disant* "Government," and the tributary black mail demanded by the nearest ruffian who has a horde at his back.—*Calcutta Englishman, May 5.*

COMMERCE OF BOMBAY.

At the present moment, the commerce of Bombay is placed in a peculiar and unprecedented condition. The real nature of our rupture with the Chinese, seems never to have been sufficiently understood by the native community, and the consequence has been, as would naturally be expected by all who know the native character, that they have gone on in their operations in cottou and opium as herctofore, relying on some sudden turn which would put all things right, and which has often been experienced in the country trade betwixt India and China. Now, however, matters progress to a crisis, and with our two great products—cotton and opium—in the trade with China, it requires little penetration to foresee the disastrous consequences of a cessation of all demand, the utter impossibility of getting rid of large stocks without an immeuse sacrifice. With this view, we would urge on the Governor-Geueral of India the pressing necessity of promptitude in our pretty expeditiou against Chiua. Large commercial interests are at stake, and not only will our mother country suffer by delay, but the agricultural industry of this side of India will receive a severe check. This season the crop of cotton from all quarters is abundaut, and from this there is no vent but to Europe, and it is utterly impossible to take off the large production to that quarter. The crop from America happens also at the same time to be unusually large, and all things combine to depress our cotton prospects for the present season. The late sales of opium on the coast of China, may lead to false impressions. We are satisfied that the cultivation of the poppy must be reduced, and we have all along urged this. We cannot see how our large stocks, both of old here and of new in Malwa, can be disposed of for a long time; and if the cultivation for a season was at once put a stop to, it would be beneficial in the results.—*Bombay Times*, April 25.

PACIFIC STEAM NAVIGATION COMPANY.

On Wednesday, the Peru, one of the vessels belonging to the Pacific Steam Navigation Company, started from her moorings at Blackwall on an experimental trip down the river,and back to Blackwall. She is a very splendid steamer; her engines are of 90 horses power each, and her burden 700 tons. Over her paddles are placed safety boats of a large size, and capable of affording means of escape for the crew and passengers, in the event of fire or any other accident to which long voyages are exposed, but which precaution there is every reason to think, from the excellent arrangements of this steamer, will be superfluous. Nevertheless, it is a matter of congratulation to those who are about to traverse the immense space of water which divides England from South America, that such contrivances have been adopted for their security; and great praise is due to Captain G. Smith, the inventor and adapter of these safety boats. Their appearance adds to the elegance of the steamer, they take up less room than the paddle-boxes which in general cover the paddles, and, as they are more snug, so they hold less wind, and consequently occasion less impediment to the speed and management of the vessel. This adaptation has been made use of in the royal navy, and has been found to answer all the purposes intended by the inventor, hut it has never been employed in mercantile steamers until on board the Chili (which belongs to this company, and the Peru. A model of the invention has been exhibited at the Polytechnic Institution, and the results exhibited in miniature have been satisfactory. The Peru and the Chili were both built in the yards of Messrs. Curling and Young; their engines are from the manufactory of Messrs. Miller and Ravenhill. In these vessels, coal will not be used during the voyages, but the prepared fuel of Mr. Oran will be substituted. The company ou board the Peru on this experimental trip, consisted of nearly 200 ladies and gentlemen. Amongst them were, the Earl of Wiltshire, Lord Ingestrie, the Hon. C. Scarlett, his lady and daughter, the Hon. Mr. and Mrs. Y. Scarlett, Lord Sondes, Lieutenant Colonel Drummond, Sir T. Cochrane, R.N., Sir T. Mitchell, Surveyor-General of Australia; Captain G. Smith, R.N., Mr. G. Brown, the chairman of the company; the Chevalier De Mora and lady, and many of the merchants of London connected with the steam navigation of the empire. The company on board the Peru were entertained with an elegant *déjeuner à la fourchette* during the trip down the river; and on the return to Blackwall, a splendid dinner was provided at the West India Dock Tavern, at which Mr. Brown, the chairman, presided, and at which the company were joined by Lord Abinger and others. The object of this company is, to provide vessels to trade between Valparaiso and Panama, touching at the intermediate ports. The Chili started about a fortnight ago. Both she and the Peru will touch at Rio, and proceed through the Straits of Magellan to the Pacific Ocean. The arrival of these vessels in the Pacific, will be an era in the history of navigation. They will create a communication between localities, which cannot be attained by sailing vessels under two months,in the short space of a fortnight, and will help in no little degree to civilize the inhabitants and restore good government,—a desideratum too long wanted in the regions to which thoir operations are destined. It ought to be mentioned that, on the Peru's return to Blackwall, the efficacy of the apparatus and tackle by which the safety-boats are to ho brought into operation were tried; the boats were let down by slings into the water in less than four minutes, and the company conveyed by one of them to the shore. Each of these boats will contain upwards of 100 persons. They are in length 27 feet, and 10 feet 2 inches in the beam.

RAILWAY INTELLIGENCE,

DOMESTIC AND FOREIGN.

Railway Taxation, &c., Fourth Report.—The select committee on railways have just published their fourth report, from which we extract the following interesting particulars, referring to instantaneous communication with distant parts, by means of the Electric Telegraph. Next week, we shall give the report in full.—** "It appears that, on the Great Western Railway, experiments have been made to a considerable extent, with the view of ascertaining the best means of conveying intelligence through the medium of electricity. There is no necessary connection between railways and this new mode of communication, except that a railway possesses continuity of property between two distant places; and, also, that the numerous servants of an established railway are available to protect the machinery required for the purposes of this communication.

"Mr. Wheatstone, Professor of Experimental Philosophy in King's College, has for some years turned his attention to this subject, and has, in conjunction with Mr. Cooke, obtained patents for his inventions. From his evidence, which is especially deserving of notice, it appears that there is no difficulty in conveying intelligence to any part of the island, with an almost instantaneous rapidity, by means of a few copper wires and small galvanic batteries. There is great ingenuity in the various modes in which Mr. Wheatstone has applied the power of electricity to alphabetical communications, and your committee believe that, in a short time, further improvements in this mode of intercourse will simplify the machinery, and render the correspondence between distant parts of the island more speedy and certain, than by means of such telegraphs as have been usually employed.

"Mr. Saunders, the secretary of the Great Western Railway, states the expense of constructing the electrical telegraph on the line of that railway to have been from £250 to £300 a mile. This description of telegraph, however, when once constructed, is worked at a very trifling expense, whereas the telegraph now in use between London and Portsmouth, independent of the original outlay, costs about £3,300 a year, and the lines of telegraphic communication to Plymouth, to Yarmouth, and to Deal, were abandoned in the year 1816, on account of the expenditure required for their maintenance.

"Whenever a telegraph shall have been laid down between London, and the other ports and mercantile cities of the island, it will give to its proprietors great advantages in obtaining and transmitting information, which must be attended with most important results. For the purposes of the railway itself, this telegraph may also be frequently used to prevent the risk of accidents, and to obviate delay and inconvenience."

Opening of the London and Blackwall Railway.—This railway, which was projected in 1828, and opened to the public on Monday last, had several trips taken upon it by the directors and a numerous body of their friends on Saturday. The temporary terminus in the Minories presented a bustling and gay appearance from noon till five or six o'clock; and the inhabitants in the vicinity of the entire line, poured forth in thousands to witness the first general movement of their noisy neighbor. Windows, walls, and house-tops were valuable possessions on the occasion, and many ran the risk of breaking their necks, in order to see half-a-dozen carriages pulled along by a rope at the rate of 15 or 16 miles an hour.

The length of the railway from Blackwall to its

present terminus in the Minories (for it is to be brought into Fenchurch-street) is upwards of three miles, and the line, nearly the whole of this distance, runs through a densely-populated neighborhood, and nearly on a level with the roofs of the adjacent houses. The trains are worked by stationary engines (the cost of which has been, we believe, upwards of £30,000), the ropes being wound round immense wheels or "drums," and the time occupied in the trips on Saturday varied from between 8 and 9 to 15 and 16 minutes. The carriages, to use an expressive phrase, appeared to jolt a great deal, but the jolting was, perhaps, confined to the *drag*, in which we found it necessary, in the crowded state of the carriages, to take our station; and which was not encumbered with any roof, and was open at both ends. At one or two points of the line, the view from it was very good. The ropes by which the trains are worked, are about seven miles in length, and cost, we understand, upwards of £1,000. The starting of the trains is admirably regulated by means of an electric telegraph, by which signals are conveyed along the line in a few seconds. These stations appear, from the imperfect view obtained of them from the passing train, to have been erected with a very attentive consideration to the comfort of the passengers who may be put down or taken up at them. At the Blackwall terminus, the company have immense store-rooms, and a spacious wharf, with a fine river frontage, from which there is a very pleasing view of the Thames from Greenwich to Woolwich.

Accident on the London and Blackwall Railway.—On Tuesday, an accident of rather an alarming character occurred upon the London and Blackwall Railway. The train, which left Blackwall at 10 o'clock, had reached the bridge which crosses Caroline-street, near to Ratcliff-cross, when a pin, which connects the lever with the conducting rope, belonging to the first carriage, by some accident became loose, and fell out; and the carriage itself soon afterwards stopped; and before the pin could be replaced the other carriages of the train came up at a rapid rate, and a concussion, which smashed the "dumpers" placed at the end of each carriage to lessen the effects of their coming in collision with each other, took place, and, of course, the passengers were thrown against each other with great violence, and some were much injured. The alarm created amongst the victims was also very great, the females screaming most vociferously; a woman threw herself out of one of the carriages on to the bridge above spoken of, and was afterwards taken up much hurt; it was said that one of her legs was broken, but this has since been found to be incorrect. The carriages were stopped almost immediately, and everything was soon made right, but the majority of the passengers could not be persuaded to re-occupy their seats. The carriages continued to run throughout the day, and no other accident occurred, although an immense number of persons visited Blackwall by means of the railway. Upwards of 2,000 persons travelled by this new conveyance on Monday, and an equal number on Tuesday; and the novelty and cheapness of the road bids fair to make it, for a long time, a favorite ride for the public.

Great Western Railway.—This line will be opened to Farringdon, 63½ miles from London, on the 20th instant.

Birmingham and Gloucester Railway.—The shares of this company have recently risen from 62 to 75.

Liverpool and Manchester Railway.—Frightful Accidents.—Early yesterday morning, a man named Thomas Leftwich, employed as an engineman on the Liverpool and Manchester Railway, was killed near Eccles, and his body frightfully mangled. He was proceeding along the line with a load of goods, and was thrown off the tender, when the wheels of all the carriages, about 30, passed over him. On the same morning, a collision took place at Whiston, by which, part of a luggage train was destroyed. Two trains, heavily laden with goods, were passing up the inclined plane, when one of the carriage chains attached to the first, nearly at the summit, snapped asunder, and seven loaded carriages ran back with great velocity and came in contact with the upcoming train. The concussion was so great, that all the carriages were broken into pieces, and several tobs of butter, bales of indigo, hogsheads of wine, &c. destroyed. The engineers and firemen fortunately escaped without serious injory.—*Manchester Times*, of Saturday.

Warwick and Leamington Railway.—The directors of the Warwick and Leamington Railway have called in the services of Mr. Parc to prepare the estimates of revenue, traffic, &c., to be derived from this undertaking. We are glad of this, because, from the extensive experience of Mr. Pare, and his uniform care to justify the confidence placed in his reports by the railway public, we may expect to see such a case only made out as facts will fully warrant. Mr. Pare is admitted to have more practical knowledge of all that goes to make up railway traffic in all itsbranches, than any other railway statist of the day; and has never yet, within our observation, made a favorable report for the mere sake of pleasing an employer.—*Railwey Times.*

Derby Junction and Midland Counties Railway.—The fight between these lines commenced on the 1st inst., the day on which the latter was opened to the public. The Derby Junction lowered their fares for first-class passengers from 8s. to 2s. It is calculated that, if the Midland Counties Company reduce theirs in the same proportion, it will diminish their receipts at least £50,000 a year.—*Railway Mag.*

Superintendence of Railways.—Having called the attention of our readers, on Wednesday week, to a most objectionable clause in the Railway Bill introduced by Lord Seymour, and having read a copy of the amended Bill, we are happy to be able now to say, that the measure has undergone in committee a very material alteration. For the clause requiring railway companies to submit their profit-and-loss accounts to the inspection of the officer appointed by the Board of Trade, the following clause has been substituted:—

"And be it enacted, that every railway company shall cause to be kept by some proper officer, at one of the principal stations of such railways, or at some other fit and accessible place, all such registries, books of account, and other books relating to the maintenance of the said railway, and the traffic upon the same, and the servants and other persons employed in, and the regulations concerning the business of the said railways, and the tolls and other charges imposed, and the accidents, losses, and damages happening and incurred thereon; and shall distinguish therein such particulars relating to the matters aforesaid; and shall from time to time furnish such copies or extracts of the said books, and made such returns therefrom relating to the matters aforesaid, and in such form and manner, as the Lords of the said Committee shall require; and shall, if required, inform the Lords of the said Committee of the place in which the said books are kept, and the name of the officer in whose custody they are."

Several minor changes have been made in other parts of the bill; and four new clauses were added in the committee,—one, transferring from justices of the peace to the Board of Trade the settlement of certain differences as to the means of effecting communications between a railway and any collateral line constructed on the adjoining lands; and another, authorising any agent of a railway company, or special constable, to take into custody any railway servant doing, or attempting to do, any act whereby injury may result to the public or to the company's works, and empowering and *requiring* magistrates to punish the offender by fine or imprisonment, with or without hard labor.

This latter clause is of the highest importance; indeed the whole measure is greatly improved, principally through the exertions of the London and Birmingham Directors, and their able Chairman.

The report, we believe, was to be further considered in the House of Commons on Thursday evening; but we presume its principle has been satisfactorily arranged, and that, as it now stands, the leading railway companies feel no indisposition to concur in the measure.—*Manchester Guardian.*

Railway Passenger Tickets.—*To the Editor.*

Sir,—Your paper of Saturday, contains a valuable soggestion in reference to the conveyance of passengers' luggage by railway. It is there stated that, in America, the plan acted upon for securing the property of travellers, is to attach to each person's luggage a brass ticket, with a number to it, the passenger being at the same time presented with a duplicate, upon the receipt of which the officers of the station restore to him his own. Now, sir, it is a notorious fact, that great inconvenience and considerable losses have been occasioned by the absence of anything like arrangement in this department. A train, for instance, arrives at one of the London stations. The parties are no sooner uncaged, than a general scramble ensues, of cab-men, omnibos-men, porters, proprietors of luggage, and *usurpers* of the same, in which, for any regulation existing to the contrary, a man may take his own, or select his neighbor's, *ad libitum.*

All this must be allowed to operate very detrimentally upon elderly people and unprotected females.

I shall now suggest a remedy, by informing you how these things are managed on the Paris railroad. The plan is similar to, but perhaps more simple than the American. There are two entrances to the station—one for luggage, the other for passengers. On arriving, you deposit your effects, to each of which a *paper* ticket is affixed, with a number, the duplicate of which is handed over to you. On reaching Versailles, there is, I believe, a room set apart for the reception of luggage, before it can be claimed. In consequence of this arrangement, the passenger receives what belongs to him without the least confusion.

There is another regulation especting the passengers themselves, which may as well be noticed. On receiving their tickets, they are introduced into two rooms, set apart for those of the first and those of the second class in the train respectively. The tickets are numbered, as are also the carriages. A few minutes before the departure, the doors are opened, and each person is shown to his carriage as signified on the ticket, and to his particular place in the carriage, which is also signified.

This, you will say, is comparatively of no consequence. The luggage arrangement, however, or rather the total want of it, is of very serious importance, and I am convinced the public as well as the companies themselves, when the matter has been fairly stated to them, will agree with me, that it ought to be reformed altogether, and that as soon as possible.—*Your Constont Admirer,* Z.

Railways.—Progress of Puritanism.—A remonstrance from 48 clergymen has been made to the directors of the South Western Railway, against Sonday travelling! The directors, in reply, charged the clergy with want of charity, and pleaded necessity as an excuse. A similar remonstrance has been forwarded by 348 persons, clergy and laity, in the neighborhood of Winchester, but without success.—*Berkshire Chronicle.*

Opening of the Glasgow and Ayr Railway to Beith.—On Wednesday, the Directors of the Glasgow and Ayr Railway, with Mr. Miller, engineer, and Mr. Humfrey, secretary, made an experimental trip along the newly-completed part of the line, from Kilwinning to Beith, a distance of eight miles. They were accompanied by deputations from Irvine and Kilwinning.—*Edinburgh Advertiser.*

Railway Openings.—The months of June and July form quite an era in the extension of railway communication. On Wednesday last, we noticed the opening of the Lancaster and Preston line, throughout, on Friday week; and the partial opening of the Birmingham and Gloucester line from Broomsgsove to Cheltenham, on the Wednesday previous. The opening of the Hull and Selby Railway,

throughout, took place on Thursday last; the opening of the North Midland Railway, throughout, on Wednesday last; and the opening of the Midland Counties Railway, on Tuesday last, from Leicester to Rugby. By these openings, lines of direct railway communication are now formed from London to Leicester, Nottingham, Derby, Sheffield, Leeds, York, and Hull; and from London, by Birmingham, Warrington, and Preston, to Lancaster. London and York are now placed within *ten hours' distance* of each other. Between the two great ports of Liverpool and Hull, there is now only one link wanting in the chain of railway communication, viz., the completion of the Manchester and Leeds line, between Littleborough and the North Midland line, near Wakefield, a length of only 36 miles.—*Manchester Guardian.*

FIRES UPON RAILWAYS.—We understand that bills to the amount of £700 have been sent in to the Birmingham Railway, for damage done by a fire which happened some time back. This is exclusive of the two last fires. The damage by the late fire on the Great Western, it is supposed, will fall little short of £2,000. Surely these are reasons enough, to excite men to find out some preventive to these lamentable disasters.—*Railway Mag.*

RAILWAY PROPERTY AS AN INVESTMENT.—A correspondent calls our attention to the extraordinary increase in the value of railway property, which has taken place within the last six months. Comparing the quotations in our share list of the 14th December last, with those of the 13th inst., it will be seen that upon twenty lines this increase amounts to upwards of *eight millions sterling!* Thus, the Great Western shares in that period have risen £52 per share, namely, from 10 discount to 42 premium, equal to £1,300,000 upon the 25,000 original shares; the new shares have risen from 5 discount to 20 premium, equal to £625,000—making altogether £1,950,000 upon the old and new shares. The London and Birmingham shares have in like manner risen from 50 premium to 99 premium, equal to £1,225,000 upon the 25,000 original shares: the quarter shares have risen from 22 to 30 premium, equal to £200,000; and the new shares have risen £13, equal to £405,950—making altogether upon the shares, a sum of £1,830,950. The shares of the other lines in the following table are computed in the same manner:—

Great Western	£1,925,000
London and Birmingham	1,830,950
Grand Junction	829,000
London and South Western	612,000
Eastern Counties	448,000
North Midland	420,000
London and Brighton	360,000
Manchester and Leeds	312,000
Midland Counties	240,000
Manchester and Birmingham	180,000
London and Croydon	165,000
Great North of England	150,000
London and Blackwall	120,000
York and North Midland	102,000
Birmingham and Gloucester	95,000
Chester and Crewe	90,000
Bristol and Exeter	90,000
Cheltenham & Great Western	75,000
Birmingham and Derby	63,000
London and Greenwich	60,000
Total improvement in value	£8,166,950

These results cannot fail, as our correspondent remarks, to be most gratifying to railway proprietors, as showing that public opinion has undergone a change; that railways are no longer viewed with suspicion, as the mere speculations of a day, to be spoken of in the same breath with Spanish bonds and American state paper; but that they are regarded as real and valuable investments in the soil. —*Railway Times.*

BRUSSELS.—PROGRESS OF THE TUNNEL OF BRAINE LE COMTE.—The works in the tunnel of Braine le Comte, have proceeded with such activity that the workmen can now go from one end to the other. Three sets of bricklayers are employed at this difficult and important work. Three wells have been sunk in the tunnel. If the work proceeds at the same rate, this part of the railway from Brussels to Mons will be finished before the expiration of a year.

COMMON PLEAS—FRIDAY, JULY 3, 1840.

Before the Right Hon. Lord Chief Justice Tindal.

BAIRD v. ROBERTSON, LATE SECRETARY TO THE EASTERN COUNTIES RAILWAY COMPANY.

In this case, the plaintiff sought to recover the sum of £400 from the defendant, Robertson, paid by the plaintiff into his (the defendant's) hands, and which had been appropriated by the said defendant in an improper manner.

Serjeant CHAMELL opened the case for the plaintiff; and established his claim so fully, that the jury immediately returned a verdict of £400 damages for the plaintiff.

GRATUITOUS COPIES

of our Journal have been forwarded to a number of Individuals interested in some Patent, or Invention, of which notice has been taken in our number of to-day.

TO CORRESPONDENTS.

We shall, at all times, be ready to ANSWER QUESTIONS *that may be put to us, relative to any of the subjects indicated in our title; and questions put during the current week, will be replied to either the same, or following week.*

"THE INVENTORS' ADVOCATE, *and* JOURNAL OF INDUSTRY," *may be forwarded,* postage-free, *to all the undermentioned places:—*

Antigua	Demerara	Montserrat
Bogota	Denmark	Nevis
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Barbadoes	France	Newfoundland
Berbice	Gibraltar	Nova Scotia
Bermuda	Greece	Quebec
Brazils	Grenada (New)	Spain *via* Cadiz
Bremen	Halifax	St. Domingo
Buenos Ayres	Hamburgh	St. Kitts
Canada	Heligoland	St. Lucia
Caraccas	Honduras	St. Vincent's
Carthagena	Ionian Isles	Tobago
Cephalonia	Jamaica	Tortola
Columbia	Laguayra	Trinidad
Corfu	Malta	Zante
Cuxhaven		

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"THE INVENTORS' ADVOCATE" *is published every* SATURDAY MORNING, *at* 7 O'CLOCK; *if, therefore, our Subscribers do not receive their copies* regularly *from their Newsmen, the fault never rests with* US.

For the convenience of persons residing in REMOTE PLACES, *the* "INVENTORS' ADVOCATE," *will be regularly issued in* MONTHLY PARTS, *stitched in a handsome wrapper.* PARTS 1 *to* 12, ARE NOW READY.

ADVERTISEMENTS *should be sent in not later than* Thursday Evening.

"A lover of True Science" *must be aware, that we cannot insert his communication without first knowing his name and address. It involves an attack upon an individual, who may be, for aught we know to the contrary, innocent of the charge brought against him. The whole article savors strongly of a party spirit, and the writer seems to have some object to attain, at the expense of another man's reputation.*

"W. E."—*In answer to our Correspondent's question, we answer in the affirmative. He will find, by referring to the half-yearly list of patents inserted in the present number, that a patent for a thermometer for the use he mentions, was taken out in* 1830 *by Dr. Ure. Should any further information be required, we shall be happy to afford it by letter, in the event of our Correspondent furnishing us with his name and address.*

"J. W. Wrightson," Lancaster.—*No; we have before repeatedly stated, that a patent can only be for a* "manufacture."

"J. C. Chapman."—*The invention is not new; a patent of a similar kind was taken out in* 1832, *as will be seen by reference to the Index of our Second Volume just published.*

TO OUR SUBSCRIBERS.

Two *numbers of the* "INVENTORS' ADVOCATE" *(Nos.* 48 *and* 49*) were published* July 4. *The former contains, in addition to the usual varied matter, the* TITLE PAGE *and* a Copious INDEX *to the* SECOND VOLUME.

VOLUME II. *of the* "INVENTORS' ADVOCATE," *handsomely bound, is* NOW READY. *A* FEW COPIES *of the* FIRST VOLUME *still remain on hand.*

TO INVENTORS.

ALL PERSONS who may be desirous of TAKING OUT PATENTS, or of bringing VALUABLE INVENTIONS into USE, are requested to APPLY to the PROPRIETORS of "THE INVENTORS' ADVOCATE," (DELIANSON CLARK & CO.) at their "PATENT AGENCY OFFICE FOR ALL COUNTRIES," 39, CHANCERY LANE, where they may be consulted, daily, relative to the PATENT LAWS of GREAT BRITAIN, and ALL OTHER STATES.—(See ADVERTISEMENT on the last page of the present Number.)

THE

INVENTORS' ADVOCATE,

AND

JOURNAL OF INDUSTRY.

SATURDAY, JULY 11, 1840.

WE have this week given, at some length, a biographical notice of the late Mr. John Cockerill, of Seraing, near Liege, who has done more towards spreading a knowledge of the mode of constructing machinery on the continent, than any other individual; and the effects of whose exertions, in this respect, will probably have a serious influence, ultimately, on the interests of this country. A glance at the immense concerns in which he was engaged, will be sufficient to show the vast nature of his plans, and the almost unlimited sphere of his operations, which comprised the whole continent of Europe, and even embraced India within its reach. The number of workmen in his various manufacturing establishments, could not have been less than 5,000—an immense mechanical force, that has been created, for the most part, by his genius, industry, and enterprise. It would, however, be taking much too narrow a view of the influence exercised by Mr. Cockerill on the

manufacturing industry of the continent, were we to limit it to the immediate bounds of his own establishments, numerous and extensive as they are, for there can be no doubt that the example of enterprise he afforded, stimulated others to undertake similar speculations, and has been the means of diffusing a taste for mechanical arts through a large portion of the industrious classes of northern Europe. The benefits conferred by such a man on the country favored by his exertions, are greater far than those the most successful general or the most skilful statesman can bestow. They are not evanescent, nor of doubtful character, but are calculated to extend their influence to remote ages, and to add permanently to the national wealth and prosperity. It is for Belgium, more especially, to do honor to the memory of Mr. John Cockerill, though the whole continent of Europe has participated in some degree in the advantage of his labors.

We scarcely know whether to be most proud or ashamed to acknowledge that Mr. Cockerill was an Englishman—proud to own so distinguished an individual as a fellow-countryman, or ashamed to reflect that he was obliged to seek, in a foreign country, that encouragement for his mechanical genius and manufacturing skill that he could not find in his native land. The example that Mr. Cockerill's progress affords, ought to serve as an invaluable lesson of the impolicy of the indolent, *laissez faire* system of this government, respecting improvements in mechanical science, and of the folly of those prohibitory laws, which, formed in an unenlightened age for the protection of our manufactures against foreign competition, have been continued to the present time, though their effects have been shown to be decidedly injurious.

The plan of endeavoring to maintain the exclusive privilege of any manufacture within the kingdom, by prohibiting the supply of machinery to other nations, and by interdicting artisans from going abroad, is one of the most narrow-minded and short-sighted, as well as most tyrannical systems that can be adopted. That it defeats its object, is strikingly exemplified in the case of the Messrs. Cockerills, for the machinery which Mr. W. Cockerill confined himself to manufacturing when he first settled on the continent, was of that kind only which was forbidden by the laws of this country to be exported. These prohibitions are founded on the notion that by preventing foreigners from having the machines, they will not be able to become manufacturers; but prohibitions of this kind cannot long be of any use, and if they check for a limited time the establishment of any peculiar manufacture abroad, they are sure to have prejudicial effects, in other respects, that far outweigh any temporary advantage to be gained by the shortly prolonged monopoly.

The establishment of Mr. W. Cockerill, at Liege, commenced on the smallest scale, but it rapidly increased in magnitude, and at length, by the enterprise of his son, the manufacture of machinery at Seraing became the largest in the world, and, in the words of the biographer, whose notice we have given elsewhere, the machines of various kinds manufactured there, absolutely "inundated" the whole continent. Other Englishmen, attracted by the success of the elder Mr. Cockerill, also followed his example, and expatriated themselves, to seek their fortunes in countries where mechanical genius was more encouraged, and they have succeeded in erecting a new kind of manufacture abroad for the supply of machinery, which, had a different system of policy been pursued, might have been almost confined to England. We have, by this impolitic course, deprived ourselves of such an advantage, and have contributed also to give a stimulus to mechanical genius and enterprise abroad, that may eventually be the means of seriously injuring the manufactures of this country.

It is only when instances occur so flagrant as that which the case of Mr. Cockerill presents, that any sensible impression can be made against ancient and firmly-rooted prejudices; and then, it is usually too late to remedy the evil. We do hope, however, that this example will not be allowed to pass without its influence, and that the attention of the government and the legislature may be thus aroused to the importance of more directly encouraging mechanical skill, and of removing all restrictions and prohibitions that fetter the energies of trade and mechanical enterprise.

THE ACTION OF CENTRAL FORCES.

Most of our readers are probably well aware, that forces acting from a central point diminish in the ratio of the squares of the distance; but there are many, perhaps, who are not aware of the cause of this peculiarity, which obtains in all such forces. Numbers, indeed, we may venture to assert, have learned the rule by rote without really knowing the signification of the words, and still more without having an accurate idea of the principles on which that rule depends. We shall, therefore, endeavor to give a simple practical explanation of the cause, why the intensity of a power when acting in all directions from a point must vary in an inverse ratio to the square of the distance. Many of the most important phenomena of nature are known to depend upon this law, and we conceive that many others, at present involved in obscurity, will probably, 'ere long, be traced to the same origin; it is therefore highly essential that the subject should be clearly understood, and that all mystification respecting it should be removed.

If from any point a circle is described, with a radius of two inches, for example, and from the same point another circle is described within it, with a radius of one inch, then the diameter and circumference of the larger circle, as well as the radius, will be exactly double the size of the smaller one. In globes of the respective diameters of one and two inches, however, the surface of the globe of two inches diameter is four times the extent of the surface of the one-inch globe. This will be made apparent by the following illustration. If two straight lines be drawn from the centre of the two circles to any points on the circumference of the larger one, the lengths of the two arcs (the portions of the circle contained between the two points) will be as one to two; and if straight lines be drawn from point to point, the lengths of these chords, as they are called, will also be as one to two; the chord of the circle of two inches radius being twice the length of the chord of the circle described with a radius of one inch. But if squares be drawn on these two lines, or chords, the square of the longer chord will be four times the size of the square drawn on the chord of only half the length; therefore it will be seen that straight lines, or rays, proceeding from a centre in all directions, are spread over four times the surface when they act at only half the distance. The amount of power is in this case spread over four times the space, and the force being thus diffused, its intensity on any given point of the same size, must necessarily be diminished four times. The same illustration may be applied to any distances with the same results; for each time the distance from the centre is doubled, the surface over which the action is spread is quadrupled. It would be an improvement in the expression of the rule, that the "power diminishes in the ratio of the squares of the distance," to add, "and the acting surface extends in the same ratio;" or,

in other words, as the intensity of central force diminishes the range of their action increases.

Suppose, for example, the intensity of the rays of light issuing from a candle was measured at the distances of one and two feet. At a distance of one foot the same quantity of light would be confined within the space of one square inch, which, at the distance of two feet, would be spread over four square inches; and the intensity of it would of course be diminished in the same degree. The same principle applies to all central forces, whether emanating from a point, or attracting bodies towards them: as the sphere of their operation is extended, the intensity of their power is diminished in proportion to the space over which it is spread. The amount of force in the acting bodies, remains the same at whatever distance it operates, though the effects may be different.

It will be perceived from this consideration of the action of central forces that the variation in their intensity in the ratio of the squares of the distance, is an absolute law of nature, to which all such forces must necessarily be subject; though the different effects produced by central forces, when acting at minute distances, has sometimes lead to a misconception on this point. This difference depends on the varying distances from the centres of action. For instance, the attraction of gravitation, which acts from the centre of the earth at a distance from its surface of about 4000 miles, is not perceptibly diminished at any height within our reach; and to diminish the force of its attraction to one fourth, it would be requisite to remove a body to twice the distance from the centre of the earth. Supposing, however, a particle of matter, the one hundredth part of an inch in diameter, to be the attracting point; then, at double the distance from its centre, the attracting force would be diminished four times, at twice that distance it would be diminished sixteen times, and when removed from it only one quarter of an inch, the force of attraction would be reduced to an almost unappreciable quantity, though in this case, as in that of gravitation, it would be diminishing only as the squares of the distance.

We alluded to the rapidly diminishing attractions of radiating forces when proceeding from minute points, in a recent article on electro magnetic engines; and the preceding observations will more clearly explain the cause of the very limited sphere of electro-magnetic attraction. The opinion now very generally entertained, is, that all attracting forces are merely different modifications of the same power, and that electrical attraction and chemical affinity are only varied phases of the attractions of cohesion and gravitation. The consideration, therefore, of the actions of this power becomes highly important; and if it be established as a law of nature that all central forces diminish in the ratio of the squares of the distance, we conceive that a guide may by this means be obtained to the discovery of the magnitude of the ultimate atoms of matter.

NEW INVENTIONS.

IMPORTANT IMPROVEMENTS IN PRINTING.

In the "*Inventors' Advocate*," of the 27th June, we gave a short abstract of the specification of Mr. Morison's Patent; we have since had an opportunity of inspecting some of this gentleman's operations. We are unable in the present number, to go into any details, but when the necessary engravings are ready, which will be in a few days, we shall have great pleasure in laying them before our readers. Both in the rapidity of production (*without the use of steam*) and in the power of combining colors, and throwing off impressions from *flexible* as well as *hard* substances, we consider these operations in Printing as almost unparalleled in the history of modern art; and as opening up new and unlooked-for modes of communicating knowledge, and multiplying works of art.

PAINTING ON LIME, &c.

M. Heideloff, a professor at Nuremburgh, has succeeded, after many investigations and numerous experiments, in fixing paintings unalterably, and at little cost, upon lime, gypsum, and stone. The application of this process has been successfully tried in the cathedral at Bomberg. The process is extremely simple. The size, for binding the lime, is formed only of milk, and the preservation of the painting from heat, cold, and damp, is solely attributable to the method of preparing this mixture. This invention has also the additional advantage that the paintings done in this manner may be washed with water without losing any of the freshness of their colors. It may be added also, that lime receives the colors better than fresco.

KALSOMINE, A NEW PAINT.

A new and inodorous sort of paint, the invention of Miss Fanny Corbeaux, has been lately introduced to public notice. The materials of which it is composed, are at first soluble in water; and while in this state admit of the design being effaced, or a portion of the coloring of a wall or ceiling being removed, if necessary; a subsequent operation renders the paint insoluble, by a chemical change of the properties of the material, which fixes the color durably. It is free from any offensive smell, dries in a few hours, is not acted upon injuriously by atmospheric influences, and is said to be more durable than oil paint, as well as more agreeable to the eye, and not at all prejudicial to the health; indeed, a room painted with it one day, may be inhabited the next. It may also be made applicable to easel painting also. We have seen a little landscape painted with this material, which combined something of the depth and solidity of oil with the transparency of water-color; and a specimen of broad flower painting, for a room, was shewn us, which had resisted the rude action of the scrubbing-brush. The effect of the white as a ground for gilding, is extremely clear without being dazzling; and we can well understand that it possesses the property ascribed to it of "softening and diffusing light."—*Athenæum.*

PROTECTION OF BUILDINGS FROM THE EFFECTS OF FIRE.

Mr. Levingston, an English gentleman connected with the invention of a composition plaster to preserve houses from fire, has just made an experiment in the presence of a number of citizens for the purpose of showing the value of this discovery. By permission of the inspectors of the Eastern Penitentiary, Mr. Levingston had put up, in the yard of that prison, a small frame building, in size and appearance resembling the lime-houses seen every day in the streets in front of large buildings. The ceiling, sides, and floor of this building were covered with the fire-proof composition, and a second floor laid over it. The roof, too, was covered with the composition, and on this were laid shingles in the usual way. The floor being strewed with shavings and light chips, fire was communicated, and the whole interior was immediately filled with smoke and flame. The outer coat of white plaster soon yielded to the heat, and fell in large patches. Chips and shavings were then added to the fire, until until the effects of the heat could be seen and felt in the steam issuing through the joints of the exterior covering, given out by the unseasoned wood. Fire was also communicated to the shingles on the roof, but these were so closely laid on the composition, that the flame was soon extinguished by the wind. The fire was continued in the interior of the building about half an hour, without being communicated to the lathing, scantling, or exterior board covering. The experiment was deemed highly successful by all who were present; it proved very satisfactorily, that a covering of the fire-proof composition preserved the interior wood, though heated to a high degree. As a coating for board or stud partitions, it will prove a great security against fire. For bridges and structures exposed to extra risk from fire, it would seem to be a most desirable invention: it deserves the notice of the owners of such and every other description of property.—*Philadelphia National Gazette, May* 16.

NOVEL WIND ENGINE.

We have been much gratified this week, in examining a wind engine for fen drainage, upon a very improved construction. The object of the inventor (Thomas Brighty, Esq., of Ramsey) seems to have been to produce a machine that shall not be affected by the head thrown against it, to render the least motion of the air available to raise a corresponding weight of water, which may be increased exactly in proportion to the strength of the wind, and (what is entirely a new feature in the above machine) it may safely be left "to take care of itself," requiring only occasional attendance; it clothes itself when the water is high, and when low, unclothes and stops; and let the wind be never so strong, it cannot stir until the water has again risen to a certain pitch; then, if the wind is sufficiently strong, it clothes and sets itself in motion, and continues going until the water is reduced to a certain level, when it at once unclothes and stops. The machinery is extremely simple, and not subject soon to get out of repair.—*Cambridge Independent.*

NEW PATENT LETTER BALANCE.

We have seen a most ingenious and elegant piece of workmanship, invented by Professor Willis of Cambridge, and manufactured by the Messrs. Ratcliff, of Birmingham. It is a patent letter-balance; the principle of it is thus explained by the inventor:—

"The recent Post-office regulations have suggested a new problem in weighing-machines, namely, to make them indicate rapidly, not exact weights, but the number of entire ounces, next greater than

the weight of the letter or packet. In this balance, the employment of separate ounce weights, placed in a rack, so as to be lifted or deposited in succession, compels its index to move through definite steps, in the same manner as the postage-rates it points out.

"For example,—a letter, the weight of which lies anywhere between two or three ounces, whether it exceed two ounces by a few grains only, or by three-quarters of an ounce or more, raises the index to 6d, the proper sum to be paid."

Some instructions follow, pointing out the mode of using it; but the instrument makes its use intelligible at a glance: we give, however, the instructions for the sake of more careless observers. We repeat, that the machine reflects the highest credit on the inventor for its ingenuity and simplicity, and on the manufacturers for the beauty of the execution:—

TO USE THE INSTRUMENT.

"Place the letter or packet in the scale, and observe the index.

"If the weight is less than half an ounce, the index will point to one, and the postage is 1d.

"If the weight exceed half an ounce, the index will rise and point out the proper postage.

"But if the index rise above ten, the supplemental weight must be placed in the notches near the index wire, which will then point to the proper postage, on the reverse side of the index plate.

"The packet should be placed gently in the scale, to reduce the oscillations which are inseparable from all well-constructed weighing machines; or the balance may be held down by the index wire, and gradually relieved after the letter is deposited, which will entirely prevent the vibrations, and prove the most rapid way of employing the instrument."—*Times.*

HARBOURS OF REFUGE.

To the Editor of the "Inventors' Advocate."

Sir,—Observing in your intelligent Miscellany of the 27th ult., the Report of Her Majesty's commissioners on the *South Eastern Harbours*, I beg the insertion, in your journal, of the following observations:—First, allow me to premise that I was the first who recommended to the public the principle of constructing harbours *with double entrances, and without back or sluicing waters*, so as to obtain a free ingress and egress, in all winds and at all times of the tide; a principle *now proposed* to be adopted by Her Majesty's commissioners.

The subject of the Harbours of Refuge, long neglected, is of primary importance to this great nautical and maritime nation, the lack of which perils a large portion of the annual loss of property by shipwreck, amounting to £3,000,000, and of human lives in the same time, 1,000.

Two of the sites recommended as eligible for the construction of refuge harbours, are objectionable, because the contemplated advantageous and indispensable requisites of a Harbour of Refuge could not, at either place, be obtained—viz. ingress and egress *at all times*.

1st.—That proposed at Foreness in the vicinity of Margate. Vessels parting from their cables and anchors in the Downs, in a gale from the S.W. & W. S.W., could not possibly fetch the proposed entrance to the harbour, and therefore would inevitably be blown into the North Sea, in a state of distress, at the peril of ships and their crews. Should vessels take shelter in the harbour, and a gale ensue from the north, and eastward (*a fair wind down channel*), the East and West Indiamen, and other vessels bound westward, would lose their passages, an occurrence not infrequent at Ramsgate; in consequence of this, ship owners are wont to admonish the commanders of their vessels not to take shelter at that port.

2nd.—The proposed harbour near Beachey Head is liable to similar objections.

On the proposed plan to environ Dover Bay with a breakwater, I beg to observe that the water there is already so shallow, that, in a gale from the S.W., large ships at anchor would strike at low water and sustain damage; and the ascertained disposition of all bays to decrease in depths of water, aided by a constant deposit, the natural consequence of the interception of the tidal water, by the proposed breakwater, would, in a short time, fill up and render the intended harbour inaccessible.

That a Harbour of Refuge can, and ought to be constructed, without *loss of time*, at Dover, I have not the least doubt, so as to be adequate to contain 3 to 400 sail of vessels, and to admit a free egress and ingress to steam packets and other vessels drawing 10 feet of water, under all circumstances of wind, weather, and tides; and at high tides large class vessels might enter and depart with the same facility: all this could be accomplished for a sum under £300,000, and secure all the advantages that *can be obtained* by a Harbour of Refuge on this part of the coast.

I am, Sir,
Your obedient servant,

July 6, 1840. HENRY BARRETT.

SCIENTIFIC MEMORANDA,
AND
NOTES ON ART.

Agricultural Improvement.—Among the patents recently granted, is one to Mr. Edward Moody, Maiden Bradley, Wilts, for improvements in machines for preparing turnips, carrots, parsnips, potatoes, and all other bulbous roots, as food for animals. This improvement is for reducing turnips, carrots, &c., into a pulp, which the inventor considers better, and more nourishing for cattle.

Gilding by Electric Decomposition.—M. Delarive has announced to the Academy of Sciences at Paris, that he continues his experiments on the gilding of metallic plates by electricity, with perfect success. The method is economical, and supersedes the mode of gilding by mercury, the exhalation of whose vapors is so destructive to the workmen who use it.

Suggestive Improvement in the Manufacture of Sugar.—M. Peligot, who has lately examined the process for making sugar adopted in Martinique, which however is not considered so economical as that employed in the British islands, has suggested several improvements. He has found that 100 parts of the juice of the sugar-cane, as it exists when introduced into the boilers, contain 21 per cent. of sugar, while that of beet-root possesses scarcely 10 per cent.; the cane itself containing 90 per cent. of juice. According to Peligot, the sugar boilers in France extract 5 per cent. of sugar from the juice of the beet-root, that is, one-half, while in Martinique the product of the juice of the sugar-cane by the usual process is only from 6 to 8 per cent., or about one-third of the actual quantity of sugar existing in the juice. He endeavors to prove, that this loss depends upon the unscientific method of conducting the process. The apparatus consists of a series of boilers heated by the same fire. The juice is first introduced into the boiler which is most distant from the fire, and which is consequently the coolest; from thence it is conveyed into the remainder of the series, and is thus exposed to a gradual measure of temperature, in proportion to the concentration. Now fermentation most readily takes place at a temperature of between 80° and 100°, while it ceases to go on in fluids heated to the temperature of 140° or 160°. The object therefore should be to raise the temperature at once above this point; and not to elevate it too high, because such a proceeding will be apt to produce a greater quantity of molasses. Much loss is also sustained in the extraction of the juice by the mills; from 100lb. of cane, 50lb. of juice are only extracted, while the cane contains 90 per cent. Peligot advises that, after the cane is passed through the mill, it should be plunged into boiling water, in order to undergo a second impression.

Red color of Rock Salt.—De Serres states, that if a small portion of red rock salt be placed with a little water on the object glass of a microscope, the salt dissolves and there remain infusoria *Monas Dunalii*. The same animals also exist in clear rock salt.

Daguerreotype.—A correspondent of the *Athenæum* mentions, that M. Daguerre believes himself to be on the eve of completing an important improvement in photogenic delineation; he expects to be able to produce instantaneously the effect hitherto resulting from the action of solar light, during a certain period, on the prepared plates; and to have the means of obtaining as accurate pictures of moving objects, as have as yet been given of still objects only. If M. Daguerre's anticipations be realised to the extent which he has stated, the value of his process will be greatly increased, although the faithful pictures taken in this way will not produce the same impression on the sense of sight, as the moving objects themselves do, and may therefore disappoint expectation.

Injurious Effects of Black Paint.—The following is abridged from a paper on this subject by Mr. L. Thompson, published in the *Trans. of the Society of Arts*. There is nothing, he observes, which will prove this (the injurious effects of black paint), more than by observing the black streaks of a ship, after having been in a tropical climate for any length of time. It will be found, that the wood round the fastenings is in a state of decay, while the white work is as sound as ever; the planks that are painted black will be found split in all directions, while the frequent necessity of caulking a ship in that situation, likewise adds to the common destruction; and I am fully persuaded, that a piece of wood painted white will be preserved from perishing as long again, if exposed to the weather, as a similar piece painted black, especially in a tropical climate. I have heard many men of experience say, that black is good for nothing on wood, as it possesses no *body* to exclude the weather. This is indeed partly the case; but a far greater evil than this attends the use of black paint, which ought entirely to exclude its use on any work out of doors, its property of absorbing heat. * * Wood having a black surface, will imbibe considerably more heat in the same temperature of climate, than if that surface was white; from which circumstance we may easily conclude, that the pores of wood of any nature will have a tendency to expand, and rend in all directions, when exposed under such circumstances.—The water of course being admitted, causes a gradual and progressive decay, which must be imperceptibly increasing from every change of weather. Two circumstances, which have fallen under my own immediate notice, deserve mention. The first was the state of H.M. Sloop, *Ringdove*, condemned by survey at Halifax, N.S. in the year, 1828. This brig has been on the West Indian station for many years. On her being found defective, and a survey called, the report was to the effect that the wood round the fastenings was totally decayed in the wake of the black, while that in the wake of the white was as sound as ever. The next instance relates to H.M. Ship, *Excellent*, of 98 guns (formerly the *Boyne*). The ship is moored east and west, by bow and stern moorings; consequently the starboard side is always exposed to the effects of the sun, both in summer and winter. In this situation, her sides were painted in the usual manner of a ship of war, viz. black and white, of which by far the greater part is black; this latter portion, on the starboard side, I found it impossible to keep tight; for, as often as one leak was apparently stopped, another broke out, and thus baffled the skill of all interested. In the meantime, the side not exposed to the rays of the sun remained perfectly sound. I then suggested to Mr. Rennaway (the master caulker of her Majesty's dockyard at Portsmouth), who had previously given the subject consideration, the advantage likely to be

derived from altering the color of the ship's side from black to white. Captain Hastings having approved of the alteration, the ship was painted a light drab color where it was black before, upon which the leaks ceased, and she has now continued perfectly tight for more than twelve months; and, indeed, I can confidently state, that the ship will last as long again in her present situation, as she had begun to shrink and split to an astonishing extent when the outside surface was black, which has entirely ceased since the color has been altered.

Decrepitating Salt of Wieliczka.—This salt is distinguished from common decrepitating sea salt, by its decrepitating not only by heat, but even when dissolved in water; in proportion as it dissolves, bubbles of gas are emitted, which have been obviously condensed in the salt. M. Dumas says, this, when mixed with oxygen, detonates like hydrogen; he conceives also that it may contain carbon, but as his experiments were made upon a minute quantity, they required repetition. Rose has since found the greatest quantity of gas evolved, to amount to half the volume of the salt, and its composition to be nearly that of carburetted hydrogen.

Sir James Anderson's Steam Carriage.—DUBLIN. An experimental trip of Sir J. Anderson's steam drag for common roads, has just taken place on the Howth road, and fully answered the anticipations of all concerned. It ran for about two hours, backing and turning in every direction—the object being chiefly to try the various parts in detail. It repeatedly turned the corners of the avenues at a speed of about twelve miles an hour, and at a pressure of only about 46 or 48 pounds upon the square inch. No smoke whatever was emitted, and very little steam was observed, while even these, it is alleged, will be removed, when running publicly on the roads. The whole machinery is ornamentally boxed in, which prevents the nervousness so often experienced in railway carriages, when the movements of the different parts are exposed to view; neither do horses show any alarm when it passes them.

The directors of the English Company formed for the purposes of working out Sir James Anderson's patent, are about to assemble at Manchester, in order to witness a trial of the carriages constructed there; and it is expected that the noblemen and gentlemen forming the company will afterwards come to Dublin. It is the intention of the patentees to form a company, in conjunction with that in England, for establishing communications by means of these drags between the principal towns in Ireland, as soon as a few of the carriages now constructing, and in a forward state, are completed. It is proposed that the English company should, in the first instance, in conjunction with the railway trains from London, run from Birmingham to Holyhead; the passengers to be thence conveyed by steam-vessels to Dublin twice a day; from Dublin to Galway by the steam drags, and thence by steam vessels to New York, touching at Halifax—thus making Ireland the stepping-stone between England, Nova Scotia, and the United States, and avoiding the delay and danger of beating up the Channel, the most arduous and annoying part of the present route. The whole distance between London and New York will be accomplished, it is expected, in ten days.

VARIETIES.

Another Colossal "Invention."—We had little idea, when we first noticed the double-double sheet of the *Times* newspaper (see '*Inventors' Advocate*,' of June 27), that it would so soon appear again in a similar form. On Monday last, however, to our great astonishment, we found another paper of similar dimensions, lying on our table, equally if not more interesting than its predecessor, and so densely crowded with advertisements relating to every thing marketable, and desirable of attainment, under Heaven, that he must indeed have been an "insatiate" who should have failed to find in it whatever he might be in search of. The politician, too, was as abundantly provided for; as were the general reader, the lover of History, Literature, Amusement, and the Drama; the entire compilation presenting as remarkable a literary curiosity as ever was discovered in this world of wonders. In calling the TIMES newspaper, and the establishment of its proprietors, "the tenth wonder of the world,"—an appellation, to which, when the short space of time occupied in the production of the double-double paper, and the extraordinary channel of information open to the proprietors, are considered, they are justly entitled—we are simply doing an act of common justice. There is no establishment in the world that could have done the same thing, in the same manner, and in the same space of time; *ergo*, the "invention" deserves chronicling in our pages. Some of our Contemporaries have taken the trouble to count the number of lines, words, syllables, and letters, contained in this double-double paper, and they find, on calculation, that the letters, placed one after the other, would extend to the distance of *half a mile*!!

Archimedes Steamer.—The *Archimedes* steamer, which has created so much interest at the various ports of England and Scotland which she has visited within the last two months, arrived at Blackwall on Tuesday evening, at half-past eight o'clock, from Hull, in twenty-nine hours, having contended with a perfect gale of wind and a heavy sea, which for the last twenty four hours was directly a-head. The *Monarch*, a larger and more powerful vessel, left Hull an hour and a quarter later, and arrived about two o'clock on Wednesday morning, being thirty-four hours on the passage, under the same circumstances of wind and sea, which at times dashed completely over the top of the funnel of the *Archimedes*; thus showing the superior qualities of vessels fitted with the screw propeller in a heavy sea, &c.

Napoleon's Monument.—The *Artiste*, after having announced that the execution of the monument in honor of Napoleon at the Invalides has been entrusted to M. Marochetti, says "Six hundred thousand francs are to be given for this work. If we are correctly informed, the monument will much resemble that of Francois I. at St. Denis. Four great columns, or cariatides, are to support a marble roof, which is to be surmounted by an equestrian statue of the Emperor. Beneath the four columns is to be the funereal couch, and upon it the recumbent statue of the Emperor."

Advantage of the Penny Postage.—On Friday last, a gentleman of this town (Kelso) received from a friend in the South of England a box containing a number of glow worms. These beautiful insects did not appear to have suffered from the close confinement they had undergone, for ere they had been many minutes released they emitted their peculiar phosphorescent light. So far as we have heard, this is the first instance of the transmission of living creatures through the post-office.—*Kelso Mail.*

Discovery of a Valuable Seam of Coal.—There has been discovered at the Lochgelly collieries a valuable seam of caking coal, equal, and in some respects superior, to English coal. It has been tried at various forges, and found free from sulphur, which is prejudicial to iron. As a household coal, it is peculiarly lasting, and free from dust. Lochgelly has been long famous for its valuable splint and parot seams.—*Scotch paper.*

State of Trade.—The hosiery trade in Nottingham is in a most depressed state, and last Saturday several manufacturers stopped a part of their frames.—*Nottingham Review.*

Mr. W. Cockerill, father of the late Mr. John Cockerill, some time ago built a mausoleum at Spa, where several members of his family are interred. It is, therefore, probable that the remains of Mr. John Cockerill will be buried at the same place.

Acceleration of the Mails.—On Monday last, the 6th inst., the London and south country letters and papers arrived in Lancaster, nearly two hours earlier than heretofore. The mails to London are now despatched an hour and a half later than heretofore.—*Lancaster Guardian.*

Signs of the Times.—Last week, the implements for manufacturing linen and cotton belonging to Mr. Thomas Wilkinson, of Knaresborough, were sold by auction, when good linen looms which cost £5 sold for 10s., and good cotton looms, which cost £3 10s., sold for 10½d. Poor old England!

North American Mails from Liverpool.—The Britannia, Royal mail steam-ship, commanded by Captain Woodruff, being the first of Cunard's regular line of steam-ships to Halifax and Boston, sailed from Liverpool on Saturday, about one o'clock with the English mail. She takes despatches for the Governor-General of Canada, and immense number of letters and newspapers for the British provinces and the United States. Her accommodations are said to be excellent, and she is considered to be altogether a very superior ship. The number of passengers amount to about 70, who anticipate a quick and pleasant passage.

Departure of Sir Moses Montefiore for Damascus.—On Tuesday morning, Sir Moses Montefiore and suite left London by the Emerald, on the mission to the east, on behalf of the persecuted Jews. Mr. David William Wire, who was under-sheriff to Sir Moses Montefiore, accompanies that highly respected gentleman on the mission.

A Crisis for the Libel Laws.—We find, from good authority, "that true bills" have been found by the grand jury at the Old Bailey against some wealthy booksellers, for selling the blasphemous poetry of Shelley, contained in Moxon's edition. Warrants are issued against Messrs. Simpkin and Marshall, Saunders and Otley, and Mr. Moxon, the proprietors of the book in question. If this does not bring matters to a crisis, we don't know what will.—*Examiner.*

Gale at Fort William.—Extract of a letter from an officer in the East India Company's service, dated Fort William, May 8:—"There has been a fearful gale here, which commenced on the 28th of April, and lasted five or six days. The Nusserat, Shaw, with the first detachment of volunteers, came in last night totally disabled—masts, guns, and stock all gone. A great number of vessels are expected to return more or less crippled. I fear this will throw a damper on the expedition. The sepoys, who had never seen the sea before, suffered very much from the effects of the gale."

Inland Navigation.—A project is on foot for improving the navigation of the river Nen, from the sea to Peterborough, so as to render that place an inland seaport, connecting itself with the towns of Northampton, Leicester, Market Harborough, Stamford, &c.; and, at the same time, to drain 50,000 acres of fens, to lay dry Whittlesea Mere, and to carry lines of road through the drained country, so as to diminish the distance between London and Hull, ten miles and upwards.—*Gloucestershire Chronicle.*

Coal in British America.—It has been ascertained, by survey, that New Brunswick is one of the richest coal districts in the world.

Academy of Sciences, Paris.—At the sitting of the French Academy of Sciences, on the 29th ult., M. Gasparin was elected to the vacant seat in the section of agriculture, after a very close contest, in which he had only a majority of a few votes over M. Payen, the other candidate.

REPORTS OF SCIENTIFIC MEETINGS.

BOTANICAL SOCIETY OF LONDON.

July 3rd. Daniel Cooper, Esq., Curator, in the Chair.

The secretary announced a donation of several volumes of botanical works, together with seeds, woods, &c., from D. C. Macreight, M.D., V.P. Dr. Francis Bossey exhibited an interesting variety of *Malva Sylvestris*, with *incurved* petals, found by him in the neighborhood of Woolwich, Kent. Mr. S. Buckland also exhibited a variety of *Lapsana Communis*, with *glandular* hairs. A specimen of the rare and interesting *Buxbaumia aphylla* was presented to the society for the Herbarium, from Mr. W. Gardiner, jun, discovered on Lidlaw Hills. Mr. W. M. Holman, of Reigate, Surrey, forwarded for distribution to the members, after they had been shown at the meeting, recent specimens of the rarer plants of that vicioity, including *Aceras anthropophora*, *Monotropa Hypopitys*, *Osmunda regalis*, *Lilium Martagon* (supposed to be in a perfectly wild state), and many others. Dr. Bossey then read a paper on the "Elementary Organs of Vegetables." In this communication the author had no new matter to bring forward, his object was to illustrate, in a simple manner, the structure, functions, and uses of the several organs of which the higher classes of plants are wholly composed. Botanists usually affirm there are three elementary organs, viz., the *Cellular tissue*, the *Woody fibre*, and the *Spiral vessels*; a modification, however, of the last-named, occurs under the name of *Ducts*; by some, these are considered as especial organs.

Of the Cellular tissue.—This elementary and most simple of all structures is composed of round or oval cells, which may be separated from each other by maceration or boiling, and which are usually found more or less compressed together in all plants; constituting, for example, the fleshy part of the cucumber, the plum, the apricot, and most other fruits. Within these cells is secreted a coloring, a nutritious, and, in a few instances, a noxious or deleterious matter. Thus in the leaves, the green color *Chlorophylle* developed within, shining through the transparent wall of the cell, gives the hue to the leaf and to herbaceous stems; while in the *Corolla* (which is usually designated, popularly speaking, the flower), its various hues depend on the coloring matter termed *Chromule*, found in the little cells of which it is almost exclusively formed. A whole and extensive class of vegetables which *do not* produce *flowers*, are composed entirely of this form of tissue, and are hence termed Cellular; included in this class are (by some the Ferns) the Mosses, the Lichens, the Seaweeds, and the Mushrooms: as these do not, as before observed, possess *perfect flowers*, they are called *Flowerless*, or *Cryptogamic*, the latter term signifying that their organs of fructification are concealed. Now, as it is an axiom in vegetable physiology that the more simple the structure, the more simple are the properties yielded by that structure, it follows that as a general rule *Cellular Plants* may be partaken of with impunity, many instances of which are upon record.

We will defer (from want of space) the further consideration of this subject for a future number.

ROYAL GEOGRAPHICAL SOCIETY.

SOUNDINGS AT SEA.

At the last ordinary meeting of this society, a letter was read from Captain James Rose, of her Majesty's ship Œdipus, giving an account of some enormous soundings taken by him at sea. One of these, 900 miles west of the Island of St. Helena, extended to the depth of 5,000 fathoms, the weight employed amounting to 450lb. Another made in the latitude of 33 deg. S., and longitude 9 deg. W., about 300 miles from the Cape of Good Hope, occupied 49½ minutes, in which time 2,266 fathoms were sounded. These facts were thought clearly to disprove the common opinions, that soundings could not be obtained at very great depths. A letter was next read from Lieutenant Stokes, dated from on board her Majesty's ship the Beagle, off Port Essington, detailing the particulars of the discovery of two new rivers on the N.W. coast of Australia. The one opening from Adam's Bay, was traversed to the distance of 70 miles. It was found to have two branches, and, excepting a somewhat tortuous course, did not offer any impediment to navigation; its banks were very fertile, being lined more especially with mangroves and bamboos, the latter the first of the species hitherto seen in Australia. The other river was named after her Majesty Queen Victoria, and extended upwards of 170 miles in a direction S.E. by E. At Point Pearce, on his return to Port Essington, Lieutenant Stokes had been shot at by a native with a bow and arrow, but happily the wound was of a trivial nature, and at writing he was nearly convalescent.

NUMISMATIC SOCIETY.

June 25. Edward Hawkins, Esq., F.S.A., F.R.S., Keeper of the Antiquarian Medals, &c. of the British Museum, in the Chair.

W. F. Harrison, Esq., of Maidstone Row, Rochester, was elected a member of the society.

A paper was read by J. Y. Akerman, Esq., one of the honorary secretaries, from H. P. Borrill, Esq., of Smyrna, relating to the coins inscribed Ococleon, which are found in the neighborhood of Kuttyah, in the Ancient Phrygia. Mr. Borrill refutes the reading of Vaillant and Hardium which has Mococleon and the Diococleon of Sestini, coinciding with the opinion of M. Muirret, that no letter appears on the types prior to Ococleon. These coins he is disposed to refer to the city called Coclea, which had been noticed by Col. Leake, from the Pentagonal Itinerary, but suposed by him to be a corruption of Cotrœum, which, although not to be found in the maps and itineraries, or in the Notitia of Hierocles, or even in Stephanus Byzantinus de Urbibus; yet this, being found in the supposed locality with the types of Cyhle, the great mother, whose worship there prevailed, and with the griffin at her feet, ally them, in the writer's opinion, to Coclea. After thanks had been returned for this communication, a paper was read from B. Nightingale, Esq., on the Rosltier's, containing a portion of the autobiography of this talented family from MS. notes, which Mr. Bingley collected from personal information from a descendant of the family, and other collections formerly in the possession of Mr. Snelling. The founder of the family was born at Antwerp, and the descendants ultimately became connected with the French mint as Governors-general. From thence they came over to England, and worked for the Stuart family, and Norbert placed Nr. on the reverses of the medals executed by him. They were subsequently encouraged by Sir Hans Sloane and Dr. Mead, and intended striking a set of medals of illustrious persons and the twelve Cæsars, Newton, Locke, &c. One of them had the offer of the press of the French mint, but was dissuaded by his wife from the speculation, and remained as Governor-general. Of Norbert a portrait was mentioned.

SCIENTIFIC SOCIETY OF LONDON.

We were not, until very recently, acquainted with the existence of a society in London, bearing the above name—a name we consider cannot ever enable it to stand pre-eminent among the other learned bodies of the metropolis, seeing that each, in whatever department of natural science it particularly embraces, can, we trust, boast of as great *scientific* attainments as the Scientific Society of London; judging at least from their proceedings, of which we have received the second volume.

While wishing every society that is established, success, we can but allude in a hasty manner to the objects such an institution embraces, for it can be looked upon among scientific and erudite men as nothing more than a Literary and Scientific Institution, seeing that lectures are delivered and conversaziones held at different periods. We certainly consider such a society is likely to reflect any thing but credit, (especially if their proceedings are forwarded to journals and private individuals in foreign parts) upon the regularly and old established *Scientific Societies* of the metropolis. Let it not be imagined, that we are *Advocates* for every society or institution that springs up in the metropolis—on the contrary, we wish merely to recognise and assist to the utmost of our power those whose pretensions are either already fully established, or whose objects appear to us to merit the attention of the public.

A name of itself so striking and important as that this society has assumed, from its objects and general nature would at once strike any one unacquainted with the scientific bodies of London, as one established upon the basis, and conducted on the plan of the Royal Society.

We subjoin a list of the papers and communications read before the Society during the past session, and we leave our readers to judge (upon perusal only of the volume) of their merits.

On the Kauri Tree of New Zealand.

On the Method of Arranging Herbaria, with a comparison of the Natural and Linnæan Systems, by Mr. J. Moxon.

Notice of a New British Rose (*Rosa erecta*).

On the Flora of the Environs of Cheltenham, by Mr. James Buckman.

On the Flora of Leyton, Essex, by Mr. J. Moxon.

On the State of the Lock Gates of the Thames and Medway Canal, after 22 years' use, by Mr. Frederick Collier.

On the Early History and Principles of the Construction of Suspension Bridges, by Mr. G. F. Fordham.

On the Crag of Norfolk, by Mr. R. C. Pitts.

On the Coalfields of Belgium, by Mr. A. Dean.

On the Dorsetshire Landslip, by Mr. W. J. West.

On the Theory of Volcanoes, by Mr. C. Moxon.

On the Brick Earth of the Narr, by Mr. C. B. Rose.

Further particulars of the same, by Rev. G. B. Moxon.

On the Cheltenham Landslip, by Mr. J. Buckman.

Analysis of Iron and Coal Specimens, from Armstrong County, U.S., by Mr. S. Selldon.

On some Remarkable Properties of Light, by Mr. G. F. Fordham.

On the Crested Grebe (*Podiceps cristatus*), by Mr. Thomas Bodenham.

It cannot be denied that the above form a good catalogue of communications, which, if properly worked out, would not fail to advance science in all its departments, from Natural History to profound parts of Natural Philosophy. We have neither space nor inclination to notice any one in particular, as we do not think there is any new matter to communicate.

THE THEATRES.

"See that the players be well used."—*Hamlet.*
"Nothing extenuate, nor aught set down in malice."—*Othello.*

HER MAJESTY'S THEATRE.—The opera season is now fast drawing to a close; we have, therefore, nothing to record in the way of novelty. The opera selected on Saturday night, was MERCADANTE'S *Il Giuramento*, the principal characters in which were very ably sustained by GRISI, TOSI, RUBINI, and COLLETTI. There was a *divertisement*, in which Mdlle. CERITO introduced the new and successful *Pas de Trois* of her own composition; it was much applauded. TAGLIONI,

with Signor GUERRA, danced the favorite *Pas de Deux* from *La Fille de Danube*. The evening's entertainments concluded with the beautiful ballet, *L'Ombre*, in which we regret to say TAGLIONI met with an accident. In her descent, in the last act of the ballet, the iron hoop, with which she was surrounded in her perilous movements on to the stage, was rent asunder; and to the great consternation of the audience, the *danseuse* fell heavily,—first striking a table, and next, the stage. We were, however, glad to hear that the only injury she sustained was a slight contusion on the shoulder. No greater proof of regret could have been manifested than that shown on this occasion. On the painful occurrence taking place, the curtain dropped; every assistance having being instantly tendered by a host of friends and admirers.

On Tuesday, we were presented with the opera, *L'Elisir D'Amore*, followed by the ballet, *Le Lac de Fees;* of both these we have so often recorded our praise, that on the present occasion further comment is needless. LAPORTE took his benefit on Thursday evening, and a rare benefit it proved! He selected for the occasion, and with much judgment, the opera *Il Matrimonio Segreto*, and the ballet *La Gitana;* in the latter, those two lovely, but rival daughters of Terpsichore, TAGLIONI and CERITO,—appeared. During the week, the house has been both fully and fashionably attended.

PRINCE'S THEATRE.—The performances of the week, have been nearly as per last. We have again seen Herr WILD, but observed nothing in his performance that could induce us to alter the opinion we have already recorded of him. Madame HEINEFETTER is always charming; and the manner in which she warbles, holds us positively spell-bound. *Der Freischutz* was again repeated on Weduesday, with the same powerful chorus as heretofore. On Thursday, GLUCK'S opera, *Iphigenia in Tauris*, was produced, the characters of which were admirably sustained by Herr WILD, STANDIGL, and Madame HEINEFETTER.

The loss of POECK has been less felt than we anticipated it would have been; an admirable substitute having been found in the person of Herr STANDIGL.

The theatre closes next week; and we should say, the season has been, on the whole, a profitable one.

HAYMARKET.—Charles KEAN'S performance of *Macbeth* has quite turned the brain of our *modern* play-goers; some of whom, we observe, pronounce him far superior to any actor who ever before attempted the character. In what that superiority consists, WE should be puzzled even to conjecture. A more heterogeneous compound of extravagant mouthing, raving, grimacing, attitudinising, and stage-trickery, was never, we dare venture to affirm, exhibited on any stage. The actor certainly did not comprehend the character he attempted to portray; for there was no dignity of mind observable, no evidence of remorse, no working-out, as from necessity, of the terrible decree of fate, whereby he is irresistibly urged to the execution of the horrible deed. Every "point" was elaborately studied, and the general text repeated as set down,—*à la* parrot. The actor had evidently hammered out his materials, and arranged them, after the manner of a sermon,—into firstly, secondly, thirdly,—and so on; the whole being reduced into a series of melodramatic sketches, to which due effect was given by means of a pair of Stentorian lungs, whose "powers" we hardly know how to "rate" sufficiently "high." In sober seriousness, it was, altogether, an exhibition that we should be sorry ever again to be compelled to witness. To secure his "success," Mr. Charles KEAN'S *attachés* had come provided with a whole kitchen-garden of vegetables, which were unsparingly "pelted" at him, as he paraded backwards and forwards before the curtain. The usual "stock" garlands of the theatre were also brought into requisition; and, mixed with a few *real* flowers, they produced the "intended" effect. Oh, SHAKSPEARE! our immortal bard, turn away thine eyes from beholding such indignities as are being heaped upon thy departed spirit!

ASTLEY'S.—CARTER'S "*Acting*" *Animals*, as the worthy managers, DUCROW and WEST, naïvely style the sagacious wild beasts exhibiting here; and that gorgeous *spectacle*, the *Tower of London;* followed by the ever varying *Scenes in the Circle*, and the *Flying Palfrey of China;* have proved all attractive during the week; so attractive that, in order to get a comfortable seat, people have found it prudent to attend to the printed advice on the bill of fare,—"DON'T BE LATE!"

SURREY.—The remains of poor Mungo Park are being dragged, nightly, from the "narrow precincts of the charnel house" to have "murder most foul" committed upon them, both by bipeds and quadrupeds. Yes; he who miraculously escaped the perils of the burning sands of Africa, is now made, every evening, a gazing-stock for admiring dustmen, coalheavers, and hodmen! The *Wet Nurse*, a broad extravaganza, and the *Life of a Woman*, continue as popular as ever.

VICTORIA.—Once again has this property changed hands! It is now vested, *pro. tem.*, in a Mr. FRANKS, of the Whitechapel Theatre. He has collected, as times go, a very tolerable company; and has wisely selected as his *prima donna*, Miss PETTIFER, of the Theatre Royal, Drury Lane, a young lady of considerable personal attractions, and mental acquirements. Miss Emmeline MONTAGUE is also engaged.

THE QUEEN'S THEATRE, OXFORD STREET.—The theatre in Oxford-street, which is erected on the site formerly occupied by the Queen's Bazaar, is now fast approaching completion. It will be one of the most beautiful places of public amusement in the metropolis; and Mr. Hamlet, the goldsmith, who is the proprietor, is sparing no expense in finishing it. Many annoying difficulties met him at the outset, but, by dint of great perseverance and unwearying application, they have been surmounted. The theatre is arranged after the most approved modern principles, with regard to the accommodation in the audience part, both for sight and hearing. The decorative department is placed in the hands of skilful artists, and their selections are principally from the Louis Quatorze style, than which, for richness and boldness of relief, none is better adapted for the embellishment of theatres. The size of the theatre is somewhere between the English Opera House and the Haymarket, and the accommodations and facilities, as it regards the scenic and general stage requisites, as ample as can be possibly required. It is believed that the class of entertainments will consist of vaudevilles and other light representations—such a description of pieces as Madame Vestris so successfully produced at the Olympic, and which are essentially the kind of representations best adapted to small theatres. Connected with the theatre, but altogether distinct, is a very elegant concert-room of good dimensions, fitted up in a most costly and beautiful manner. Indeed so perfect and commodious is this elegant chamber, that little doubt is entertained of its taking the lead in the world of concerts. There is a separate entrance to it in the street at the rear, and it is approached by noble staircases leading from a spacious and elegant vestibule.

CERITO will make her *debût* in Paris, at the new Salle de l'Opera, where she will appear after the close of the Italian Opera House, which will take place in about three weeks.

TAGLIONI.—The director of the Grand Opera or Academie Royale, at Paris, has engaged Taglioni for a limited number of nights, but, we believe, the charming Sylphide was also engaged by the manager of the Royal Theatre at Berlin; yet it is doubtful whether she will visit Prussia at present, all the theatres in the capital being closed on account of the recent death of that monarch.

THE LATE JUDITH GRISI.—On Wednesday, a solemn high mass and office was performed with the usual pomp of such a mournful ceremonial, at the Sardinian Ambassador's Chapel, Duke-street, Lincoln's Inn-fields, for the repose of the soul of the late well-known and fascinating Judith Grisi, of the Italian Opera House, who died about two months since at Venice, where she had but recently been married to an eminent and wealthy banker. Mozart's celebrated mass, including the *Requiem*, *Dies Iræ*, *Offertory*, *Credo*, *Sanctus*, and *Agnus Dei*, were all admirably sung and accompanied by the first-rate *artistes* from the Italian Opera, who attended gratuitously to testify their respect for the memory of the deceased, and their regard for "the" Grisi whose fame has become so deservedly known in the world of music. The choir, which was admirably conducted by Signor Costa, and led by Tolbeque, consisted of nearly fifty first-rate performers, vocal and instrumental, amongst whom we noticed Madame Persiani, Mrs. Burnett (late Miss Dickens), Miss Davenport, with Lablache, sen. and jun., Allen, T. Welch, &c.; in the instrumental department, Barreri, Dragonetti, Lindley, Willman (clarinet), &c. The sublime compositions of Mozart in such hands, were given with the most powerful effect, particularly some of the splendid passages in that touching piece of sacred melody, the *Dies Iræ*. The sides of the galleries were all hung with black, on which were placed double wax lights all round, at distances of about three feet from each other, and the pulpit and face of the organ were also hung with a plain black drapery. The Rev. Dr. Baldaconi officiated, and was assisted by the Rev. Mr. O'Connor as deacon, and the Rev. Mr. Kyan as sub-deacon. Mutes, having long black staves and silk gloves and hatbands, were placed at each of the entrance doors to the chapel, which was filled with several of the nobility and gentry (admitted only by tickets) who were admirers of the worth and genius of the deceased. About one o'clock, the imposing ceremony was concluded, and the numerous carriage company who attended, were taken up at the residence of Dr. Baldaconi, at the west side of Lincoln's Inn-fields.

ADVERTISEMENTS.

Mining Journal Office, 37, New Broad-street, City, 27th June, 1840.

NEW WORK ON THE IRON TRADE.—The Number of the MINING REVIEW this day published, contains the Sixth Part of the Paper on the IRON TRADE, by Harry Scrivenor, Esq.—this work will be completed in Twelve Monthly Parts, and so arranged as to form a separate volume at the end of the year; in addition to which the MINING REVIEW contains—A Paper on the Establishment of a School of Mines—On the Ventilation of Mines, by Samuel Moyle, Esq., C.E.—On the Preparation of China-Clay, by W. J. Henwood, Esq., F.R.S., &c.—On Blasting Limestone Rock, being an Account of Blasting the White Limestone in the Country of Antrim, Ireland, by William Bald, F.R.S.E., M.R.I.A.—On the Applicability of Peat to Manufacturing Iron—Parliamentary Returns of the Imports and Exports of Copper, Lead, and Tin, for the year ending 5th January, 1840—Scientific Bodies, &c.—The MINING REVIEW is published at the office, as above, on the 1st of each month, price Sixpence.

The MINING REVIEW is also furnished, to subscribers, as a Monthly

GRATUITOUS SUPPLEMENT TO

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The "MINING JOURNAL" is published at two o'clock every Saturday afternoon, at the office, 37, New Broad-street, City, to which address all Advertisements and Communications are requested to be addressed. Price 6d., and may be had of all booksellers and newsvendors in town and country.

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IMPORTANT INQUIRY REGARDING THE INFLUENCE OF THE HEAVENLY BODIES ON THE ATMOSPHERE OF THE EARTH.

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N.B. A Solicitor is in attendance, daily, from Eleven till Two o'Clock, who may be consulted on all points of PATENT LAW.

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THE

INVENTORS' ADVOCATE,

AND JOURNAL OF INDUSTRY;

A WEEKLY BRITISH AND FOREIGN MISCELLANY OF

INVENTIONS, TRADE, MANUFACTURES, LITERATURE, AND THE ARTS.

PRINTED BY JOHN EAMES, 7, TAVISTOCK STREET, COVENT GARDEN.

No. 51.] SATURDAY, JULY 18, 1840. [PRICE FIVEPENCE STAMPED. CIRCULATING FREE BY POST.

CHEMICAL CONSIDERATION OF THE SUCCESSION OF CROPS.

The necessity of varying the kinds of culture on the same soil, may be considered as one of the general truths admitted in all agricultural theories. This is what is termed the law of succession. Every one is agreed respecting its necessity, but the causes which render these changes necessary, are not yet generally admitted. M. de Candolle was of opinion that the true cause of land being unproductive for plants succeeding others of the same species, was, that the ground became charged with the excretions of the roots of those vegetables; and that among plants, as in the animal kingdom, individuals of the same species could not be fed on the excrements of those of the same kind. Some experiments recently made by M. Braconnot, however, do not appear to support this theory of M. de Candolle. The followiug is the substance of M. Braconnot's experiments, which were made with a view to ascertain the influence of plants on the soil:—

Experiments of this kind, M. Braconnot observes, are very difficult to be made, and unless carefully performed, are liable to great error. He commenced his experiments on a *nerium grandiflorum*, which he placed in a pot that had no opening for the escape of the excess of water. The plant grew there very vigorously, and produced magnificent flowers for three years. He then determined to analyse the earth, to ascertain the nature of the excretions. He washed the earth with pure water, which became rather yellow, but continued almost without smell or taste. When exposed to the air, the liquid became turbid, and precipitated a quantity of carbonate of lime. A demilitre of the liquid, when evaporated, yielded 3 1 grains of a white saline residuum, which was pulverulent, without bitterness, and only 0·4 grains of which were dissolved by alcohol. When burnt, after evaporation, the remaining ashes consisted of magnesia. A portion of the saline substance, when treated with water, yielded carbonates of lime and of magnesia, and a little vegetable matter. A part of the saline residuum, which the alcohol did not dissolve, was re-dissolved in water; and acids dropped into the liquid deposited a brown flocculent substance that was soluble in ammonia, from which it was again precipitated by acids; this was gallic acid. It must be owned, that this result scarcely agrees with the theory which avers that those plants whose juices contain acrid and bitter principles, exude a portion of those matters from their roots; since those of the laurel, the acrid nature of which is well known, produced no similar product after a growth of three years in a vase which permitted none of the water to escape. M. Braconnot has examined the exudations of the roots of the plants previously experimented on, viz, the *carduus arvensis*, the *inulia helenium*, the *scaviosa arvensis*, several *euphorbias*, &c., but without the same results. He obtained different results from M. Macani, when he caused plants of the *euphorbia peplus* to grow successively in the same water. The water, when afterwards evaporated, left only a residuum that was slightly bitter, without being acrid, instead of a gummy resinous substance, extremely pungent. Experiments on the *euphorbia breoni* and the *asclepias incarnata* did not convince him that plants exude from their roots matters that are injurious to their growth. He analysed the earth of a bed in the garden of Nancy, that had for ten years been covered with poppies, which yielded the following products:—

1—Chloride of lime.
2—Acetate of lime.
3—Vegetable matter, rather sapid, soluble in water, and insoluble in alcohol.
4—Carbonate of lime.
5—Sulphate of lime.
6—Extract of mould (*extrait de terreau*).
7—Traces of chloride of soda and sulphate of potass.

Is the vegetable matter an excretion from the roots, or a product of their decomposition? The latter hypothesis appears to be the most probable. The same cannot perhaps be said of the acetic acid. After the experiments of Messrs. Becquerel and Mateucci, it may perhaps be considered as a product from the germination of the seeds.

The acetate of lime is injurious to vegetation, even in small quantities. M. Braconnot arrived at this conclusion after many comparative experiments made with plants of *mercuriale*. He repeated the ingenious experiment of M. Macani, which consists in placing a plant of mercuriale in such a manner that one portion of its roots is immersed in pure water, and another portion in a slight solution of acetate of lead. The water, when examined a few days afterwards, showed evident signs of the presence of the acetate; but he did not draw the same conclusion from this fact that M. Macani did, viz., that the acetate of lead had been excreted from that portion of the roots immersed in the water, but that it had passed into the water from the other vessel by the capillary attraction of the fibres of the roots. In fact, if the upper part of the roots which are immersed in the solution be wrapped round with blotting paper, often renewed, the acetate will not pass into the vessel with water, and yet the roots that are immersed in the water will be found impregnated with the acetate of lead, as may be shown by testing them with the hydrosulphuret of ammonia. The acetate of lead combines even at the surfaces of the roots, for by washing them some traces of it may be detected. These experiments are, therefore, not favorable to the theory of the succession of crops founded on the excretions of roots.

A paper on the succession of crops, and the effects of the vegetable matter left in the ground on the succeeding vegetation, was read at a recent meeting of the French Academy of Sciences, by M. Boussingault. The experiments he made on the subject were more with a view to practical results, than the detection of the chemical changes on the soil; and the result of his observations was, that the quantity of vegetable matter left by plants in the ground after being gathered, is no criterion of their effects on the next crop. He alludes, as an example, to beet root and potatoes; the former of which leaves in the ground a much larger quantity of vegetable fibres than potatoes, but at the same time exhausts the soil in a much greater degree.

SUPPRESSION OF LOCOMOTIVES.

The *Fanal*, a Belgian paper, in an article under the above head, suggested by the adoption of the plan of stationary engines on the Blackwall railway, contemplates the speedy substitution of that mode of propelling carriages on railways for locomotives, and claims for M. Jobard the merit of having drawn public attention to the superior advantage of employing stationary engines. "It is nearly a year," says the *Fanal*, "since M. Jobard published many articles on the necessity of making attempts to supplant locomotives, the expense of which consumes the profits of railways, by fixed engines, placed at intervals to draw the carriages, by means of an endless cord, which would admit of the carriages being readily attached to it. This plan, which has been neither objected to nor discussed, has just been tried in England with great success on a large scale. We only regret that the directors of the Blackwall railway have not been bold enough to substitute an

iron chain for a hempen rope, as recommended by M. Jobard; but this employment of iron chains, the advantages of which have been proved in Germany, is not yet sufficiently known in England; nevertheless, we feel persuaded they will be used instead of ropes when the latter shall have had their trial. Our conviction is, that this mode of *locotraction* will ultimately be generally adopted, for it is more rational than the pneumatic railway, in which we have little confidence, notwithstanding the improvements of Mr. Clegg, and the calculations of the pretended advantage of a large tube upon common rails. At all events, the latter invention proves that men of first-rate talent in England are sensible of the necessity of suppressing locomotives, and that funds will always be found there for trying any plan, however unreasonable, which has that object in view."

THE APPLICABILITY OF TURF AS FUEL.

The following additional particulars, relative to the various purposes for which turf may be used as fuel, are given by a correspondent of the *Moniteur Industriel*, named M. Renard. The experiments refer more particularly to the use of turf in making earthenware. M. Renard finds that it can be used very advantageously in burning lime, bricks, and tiles. He has also tried it with equal success in baking English stone-ware, and also porcelain manufactures, and he has no doubt that it is well adapted for baking all kinds of earthenware. He made some experiments in a small experimental furnace, with a view to ascertain the comparative quantities of heat given out by turf, deprived of all its moisture, and well-dried wood. These experiments were repeated a great number of times, and in every instance the degree of heat produced by the turf, was equal to and often greater than that produced by wood. M. Renard is so convinced of this fact, that he says he should not hesitate to construct a glass-house for the use of turf. The only difficulty he apprehends in using this kind of fuel in manufactories, will arise from the great quantity of ashes which it makes.

EXPIRED PATENTS.

PATENTS THAT HAVE EXPIRED DURING THE WEEK ENDING JULY 11, 1840.

ENGLAND.

PETER GROVES, of Liverpool-street, London, Esq., *for improvements in making paint or pigment for preparing or combining a substance or material with oil, turpentine, or other ingredients*, July 10.

SPECIFICATIONS.

A LIST OF SPECIFICATIONS

ENTERED AT THE ENROLLMENT OFFICE, UP TO THE WEEK ENDING JULY 11, 1840.

(*Continued from page* 20.)

ENGLAND.

DAVID LOW, of Adam's-court, Old Broad-street, merchant, *improvements in machinery for crushing, preparing, and combing flax, hemp, phormium tenax, and other fibrous substances*, July 7.—The first machine or crushing apparatus receives the flax, &c., in the natural state, and bruises or crushes them, by means of fluted rollers worked by cog-wheels combined in a peculiar manner, and detaches the fibres from the ligneous particles they contain.

The second, called the beating or preparing machine, receives the fibrous substances delivered by the bruising or crushing machine, and submits them to the action of beaters, that are placed lengthwise on the surface of a drum, so that the blunt teeth, while revolving with rapidity, shall separate the ligneous matters from the fibres, and prepare the latter for the heckling machine.

This machine consists of a peculiar arrangement of machinery, by which stricks of flax are progressively carried through the machine, and in their passage are continually divided, combed, and prepared by the points of double sheets of endless heckles of different pitches.

A clamp holding a quantity of flax or other fibrous substance, is made to enter at one side of the machine where the heckles revolving are wide apart, and as the clamp with the flax passes on, the operation is continued with closer and finer points until the heckling is completed. The flax is then inverted, and the clamp carries it through the machine as before.

MOSES POOLE, Lincoln's-inn, *improvements in obtaining power*, July 7.—The invention consists in obtaining power by means of an apparatus, which has a series of blades or surfaces like flyers fixed in an oblique direction to an axis, which is made to revolve, and, consequently, to carry them round at any velocity required; the atmosphere acting as the power of resistance, whereby a great power is obtained for propelling boats, carriages, &c.

The inventor proposes to work this apparatus by means of an engine, which, if placed in a boat, carriage, or car of a balloon, the flyers or blades acting on the atmosphere will cause the machine to move in any direction required.

JAMES KNOWLES, Little Bolton, Lancaster, *an improved arrangement of apparatus for regulating the supply of water to steam-boilers*, July 10.—Claims the use of a self-acting apparatus, the working parts of which are within the boiler, and communicate to the supply valve from without.

A lever or rod is placed longitudinally on a fulcrum within the boiler, the longer end of which is an upright rod, with a float attached thereon, passing to the outside of the boiler; at the shorter end of the lever is another upright rod connected with the supply valve, working in a tube. As long as there is plenty of water in the boiler, the float will continue to press up the long end of the lever, and, consequently, cause the valve on the upright rod of the short end of the lever to press down on its bearing, and prevent the admission of water from the tank. But when the height of the water in the boiler diminishes, the float lowers with it, and thereby forces up the rod with the valve; thus admitting a further supply of water until the float again rises to close down the valve.

ROBERT MONTGOMERY, of Johnstone, Renfrew, Scotland, *an improvement or improvements in spinning machinery applicable to mules, jennies, slubbers, and other similar machanism*, July 9.—The first claim is the construction and adaptation of an irregular screw, possessing various obliquities of thread or worm, that will have the effect of imparting to the mule carriage those various speeds, which are essential in putting up the carriage.

The second is the construction and adaptation of a screw as a primary movement in effecting the three following subordinate movements:—

First, the backing off or reversal of the spindles for removing the spiral coil of thread from the cops.

Secondly. The drawing back of the carriage to stretch out the yarn or thread backed off, and regulating its motion for guiding off the yarn on the spindles.

Last claim is the combination of mechanism for winding the yarn upon the spindles at the desired tension, which combination is put into action by the ingoing of the carriage.

The screw as aforesaid being a fixture, and the revolving box being attached to the carriage, causes it to go in at various speeds, and during its progress to the end of the stretch, a hanging pull presses against a spring lever, which pinches the fly-wheel and stops its action.

ENTERED AT THE ROLLS CHAPEL OFFICE, UP TO THE WEEK ENDING JULY 11, 1840.

(*Continued from Page* 20.)

ENGLAND.

JOHN RIDGWAY, of Cauldon-place, Stafford, china manufacturer, *an improvement in the moulds used in the manufacture of earthenware, porcelain, and other similar substances, whereby such moulds are rendered more durable*, July 9.—Claims the union or combination of the two parts constituting a "pitcher," to form moulds in the manufacture of earthenware, porcelain, &c.

This improvement in the moulds, whereby they are rendered more durable, consists in the union or combination of two suitable substances, to form the mould for shaping or working earthenware or porcelain, instead of making the mould of one substance or material throughout. The face of the mould, which gives the shape or form to the article to be moulded, is to be composed of a thin layer of the substance usually denominated "pitcher," which is to consist of a mixture, 8lb. of flint, 2½lb. of blue clay, 1lb. of China clay, more or less, as may be found desirable; and after baking it must be backed and strengthened by a composition consisting of three parts sand, two Roman cement, and one plaster of Paris; the whole are mixed with water and allowed to stand, when it becomes hard and durable.

JOHN RIDGWAY, of Cauldon-place, Stafford, and GEORGE WALL, of the same place, *certain improvements in the mode of preparing bats of earthenware and porcelain clays, and of forming or shaping them into articles of earthenware and porcelain, and in the machinery or apparatus applicable thereto*, July 10.—First improvement is for rolling or preparing the ordinary bats of clay by mechanical means, instead of striking and shaping them by hand-labor as heretofore commonly done.

This is accomplished by passing a lump of clay through a pair of common squeezing rollers, and thus causing it to assume the required form of bat, prior to being submitted to the mould.

Second improvement is a certain arrangement and construction of machinery or apparatus, for the purpose of forming or shaping articles of earthenware, or porcelain clays, by means of which a "profile" used in combination with a revolving mould, is caused gradually to descend upon the bottom mould, and form the article of manufacture by self-acting machinery driven by steam or other power.

By the action of one cam, the mould and spindle assume their position, while the action of another eccentric cam, with grooved periphery, traverses the strap guide, and with it the cross shaft on to the fast pulley, causing the spindle with mould and bat of clay to revolve rapidly; water is allowed to flow on the bat of clay in order to mollify it.

Having brought the mould into the "slurry" box, and the bat of clay into a proper state to its outer shape or form, another cam brings down the profile, which presses on the revolving clay and mould, by means of which the outer shape will be completed and ready to be removed.

JOHN RIDGWAY, of Cauldon-place, Stafford, and GEORGE WALL, of the same place, *certain improvements in the manufacture of china and earthenware, and in the machinery or apparatus applicable thereto*, July 10.—Claims the apparatus or machinery whereby a pair of dies or moulds for shaping, or forming the article to be produced, are fed into the machine, impressed with the figure or shape, and afterwards removed from the press by means of self-acting mechanism, instead of manual labor.

Tension rollers hold out the feeding or delivering strap, on which is placed a bat of clay. The head frame with parallel sides carries the dies; and a cam below the endless strap, causes a radial arm to

vibrate, and force the table up with the bat of clay against the mould, to receive an impress, when the feeding or delivering strap brings on the continuous bat of clay to receive the repeated impression produced as aforesaid.

NOTICE.

In accordance with the determination expressed in our 26th Number, of giving one month's clear notice to Inventors, before publishing their specifications, we hereby inform the following Patentees, that their specifications will be published in the "INVENTORS' ADVOCATE" of August 22. Each party will receive, in addition, a *private* communication to the same effect.

Robert Willis, University of Cambridge, clerk, Jacksonian Professor, due Aug. 12.
David Napier, York-road, Lambeth, engineer, due Aug. 12.
Antoine Blanc, and Theophile Gervais Bazille, Sabloniere's hotel, Leicester-square, due Aug. 12.
Thomas Robinson Williams, Cheapside, due Aug. 14
Joseph Clarke, Boston, printer, due Aug. 14.

FOREIGN CORRESPONDENCE.

FRANCE.

GENERAL STATISTICS OF FRANCE.

The Minister of Commerce has published the fourth volume of the "General Statistics of France," being the first part of the division Agriculture. It comprises the agricultural statistics of the 43 departments situated east of the meridian of Paris. The following are some of the principal facts to be remarked in it:—

The eastern half of France comprises more than 26,000,000 of hectares, and nearly 16,000,000 of inhabitants. It is divided into 177 arrondissements and 19,000 communes. More than a third of the surface is occupied by different crops, and nearly one-half, if nursery grounds, osier grounds, and fallow lands be taken into calculation. The gross average produce of corn is 84,500,000 of hectolitres per annum; of potatoes, 55,000,000; and dry vegetables, 2,000,000. Vineyards occupy 900,000 hectares of the soil, and produce upwards of 20,000,000 of hectolitres per annum, valued at 231,000,000 francs, or 263,000,000 francs, including the brandy. There are annually made in the same district 3,360,000 hectolitres of beer, and 461,000 of cider. Beet-root occupies under 37,000 hectares; colseed, 116,000 hectares; textile plants (flax, hemp, &c.), more than 100,000 hectares. Mulberry trees, only lately introduced, give 42,000,000 francs in produce, of which they are the primary source. The annual value of the total average produce may be thus tabularised:—

Grain	950	millions of frs.
Wine	264	ditto.
Beer and cider	52	ditto.
Different crops, &c.	430	ditto.
Total	1,696	millions of frs.

In very productive years, the total produce is much above 2,000 millions of francs. The quantity of land occupied in pastures of all kinds is 10½ millions of hectares; of which only one quarter are in natural and artificial meadow lands. Wood occupies 5½ millions of hectares, producing only 137 millions of francs per annum. The principal species of domestic animals specially belonging to agriculture, amount to 25 millions of heads; of which horned cattle form less than 1-5th, sheep 3-5ths, swine 1-10th, and horses 1-20th; representing altogether a capital of 877 millions of francs. A complete agricultural return for France has been attempted at various times since the reign of Louis XIV., but never successfully till the present period; when it has been commenced and nearly completed under the auspices of the system of government established in France by the revolution of 1830. The second volume, completing the agricultural returns, will appear at the end of the current year. The parts of this immense work already published include the General Introduction—Territory and Population—Foreign Trade—and the present division of Agriculture. The remaining volumes, including all the departments of Public Administration, are in course of completion.

THE RAILROAD FROM PARIS TO ROUEN.

The project of a law for encouraging the formation of a railroad from Paris to Rouen, which has occupied much of the attention of the French Chambers, was finally adopted in the Chamber of Paris on the 11th instant, by a large majority. The subject of debate arose from the desire of members to secure the formation of a railroad from Paris to Havre, which it was supposed the Rouen railway would be the means of preventing. The engineering difficulties from Rouen to Havre, it is admitted, will be very great, and it was feared that no private company would be found who would undertake the formation of that line of road, even with the aid of the government, in the form of a loan, or of a guarantee of a minimum of interest. It was contended by the objectors to the Rouen railway, that such a line was not absolutely necessary, as a communication by steam between Paris and Rouen is already established by steam-boats on the Seine, on the banks of which the proposed railway is to run; and that as a railway between Paris and the sea was necessary, it would be bad policy to throw obstacles to the promotion of such a line, by taking the route of Rouen, which would occasion greater engineering difficulties than if the railway was laid down on another line. Count Molé, who was the chairman of the commission to which the question was referred, and which gave a report favorable to the plan, stated, in explanation of the report, that the commissioners would decidedly have preferred another line to Havre than that by way of Rouen, if there had been any choice. As, however, there was no company formed or contemplated for making a railway direct to Havre, the commissioners were obliged either to adopt the Rouen line, or to abandon the idea of a railway towards Havre altogether. They would, he said, have even adopted the latter alternative, unless the Minister of Public Works had given them to understand, that the government would undertake the execution of the continuance of the railway from Rouen to Havre, in the event of no public company being willing to come forward to execute it. Count Molé observed, that he felt convinced that unless some steps were taken to complete the line from Rouen to Havre before the railroad from Paris to Rouen was finished, it would never be done, for there would then be so many local interests opposed to the scheme, that they would be sufficient to prevent its completion. The Minister of Public Works did not absolutely pledge the government to undertake the work, but he promised to bring the question before the Chambers at an early period the next session, and, in the mean time, he hoped some private company might be formed that would, with the aid of the government, be induced to continue the railway from Rouen to Havre, notwithstanding the difficulties which the nature of the country presents to its execution.

FORMATION OF VEGETABLE FIBRE.

At a recent sitting of the French Academy, M. Brongniart made a very favorable report on a paper sent in by M. Payen on the chemical composition of vegetable fibre, and its different states of aggregation. From these researches, M. Brongniart observed, we may conclude that the incrusting matter which is added to the cellular tissue of young plants is not deposited like an ordinary incrustation on the internal surfaces of the hollow fibres, but penetrate into the tissue of which the fibres are composed. The investigation of M. Payen proves the similarity of the primitive tissue of all vegetables, and points out the causes which subsequently modify its nature, and the manner in which the changes are produced. These investigations M. Brongniart considered throw great light upon many important questions of vegetable physiology and organic chemistry.

M. Duhamel read a paper, at the sitting of the French Academy of Sciences on the 6th inst., on the vibrations of sonorous cords. In this paper he takes into account the weight of the cords, which geometricians have hitherto neglected to consider in the solution of this problem. At the same sitting M. Bréguet presented a *thermomètrographe*, by means of which the temperature of the air is indicated every hour by its own action, and by a contrivance that requires no attention.

Two steam-boats now ply daily between Arles, on the Rhone, and Lyons, the voyage occupying generally 45 hours, and the amount of goods carried in a year averages from 35 to 40,000 tons. This has been effected in opposition to the opinion previously entertained, that steam navigation in the Rhone would be impossible, owing to its banks of gravel, its strong current, and the shallowness of the water. The French government, it appears, throws greater obstacles in the way of the navigation than any presented by the nature of the stream, as the duties levied on the transport of passengers amount to one-tenth the fares, and other duties are imposed that are loudly complained against, as impediments to commerce and to the navigation of the river. Among other duties charged by the government, is included a tax for the privilege of navigating the river, though there has been no expenditure of money to improve the navigation.

BELGIUM.

RAPID CONVEYANCE OF TROOPS BY RAILWAY.

An order was sent from Brussels to Antwerp, on a review day last week, for a battalion of the first regiment of carbineers to be sent by the ten o'clock train, so as to be in time for the review. The men were accordingly sent off, and before noon were on the esplanade at Brussels, in complete order. After the review the battalion had time to dine, to visit different parts of the town, and in the evening returned to their quarters at Antwerp, without experiencing more fatigue after this expedition of 20 leagues than if they had marched a quarter of a league from their barracks. "This fact," observes the *Fanal*, "proves that all the troops may be collected in a camp in the neighborhood of a railway, and be despatched from thence to any part of the country, with as much expedition as if they were quartered in the different towns. By this means, also, a smaller number of soldiers is requisite to preserve domestic peace, as they can be quickly concentrated on any point." The *Fanal* also remarks, that if these, and other public advantages arising from railways, were taken into account, the

railways of Belgium would be found to yield a profit to the state of from 8 to 10 per cent., notwithstanding the low charge for passengers.

THE CHRONICLE OF SIGEBERT OF GEMBLOUX.

The following curious particulars respecting the manuscript of the Chroniclo of Sigebert of Gembloux, that has been recently added to the Royal Library of Brussels, are given in a letter from M Baudt to the *Emancipation*. "At the time of the suppression of the abbey of Gembloux, and when all its peaceable inhabitants were driven from its walls, Don Ronald Ypersiel, at that time librarian of the abbey, a well-informed and profoundly-learned man, saved a great many very valuable books, by eluding the vigilance of the commissioners placed in charge of the library. Of this number was the Chronicle of Sigebert. Ypersiel, who afterwards became curé at Tongres, died there a long time afterwards. His natural heirs, who were ignorant peasants, unacquainted with the valuo of his extensive and choice library, put the books and manuscripts into parcels, and sold indiscriminately, in sackfuls, to the shopkeepers of the neighborhood, those valuable remains of one of the finest libraries in Belgium. Messrs. Gilles and Pierart, tobacco merchants at Gembloux, became, among others, purchasers of a cart-load full, and before tearing them up for tobacco-papers, they allowed my father to select from the heap any that he wished to have. He found among the mass a quantity of rare works in a mutilated condition. He discovered, however, among them, and saved from the fate which threatened that, as well as different other valuable works which he still preserves, this celebrated Chronicle of Sigebert, which, during a period of seven centuries, had already experienced many narrow escapes from destruction. From that time he has carefully guarded it, and the government have, since 1827, made several offers for the manuscript. In 1829 an English bibliopolist offered a very large sum for it, but he was told that this historical record would not be parted with except on condition of its being deposited in the only place proper to receive it, where all the literary treasures of ancient Belgium are collected. It is now there, in the midst of other documents, which, like it, have been rescued from the vandalism of the latter years of the past century."

A royal decree authorises the formation of an iron working company in Haine St. Pierre. The capital of the company is fixed at 500,000 frs., and its charter is to continue for 30 years.

By a royal decree of the 30th June, it is ordered that from the 1st of August next, merchandise and parcels may be sent to the Belgian railways, to be delivered at the places to which they are addressed under the charge of the government.

It is stated, in a letter from Courtrai, that the crops of flax in that neighborhood are very good, and the stalks of the plant are peculiarly fine.

The law recently passed by the Belgian Chambers, relative to the establishment of a line of steam ships between Belgium and the United States, was promulgated by a royal decree of the 29th ult.

The late session of the Belgian Chamber of Representatives lasted seven months, having commenced on the 12th of November. During this time, it held 117 sittings, and seven times there were not a sufficient number of members present to make a "house." During these 117 sittings, there were discussed and adopted 52 projects of law, the most important of which were those relative to the exportation of meal ground from foreign corn; the importation of foreign woods; the purchase of 4,000 shares in the Rhenish railway, the loan of 82 millions for the completion of railways in Belginm, and the law for establishing Transatlantic steamships. The law for the suppression of duelling, which also passed the Chamber of Representatives, has been adjourned by the Senate till next session.

STATE OF THE COTTON TRADE.

It may be worth while, at the close of the first and the commencement of the second half of 1840, to extract, from the circulars of the Cotton Brokers, the state of the market in July 1840, compared with its state in July 1839. We begin with the imports.

Imports.—There have been imported in the first six months of this year 910,748 bales against 686,457 in the same period last year: showing an increase in 1840 of 224,291 bales, as compared with the import in 1839.

Exports.—The quantity exported in the first six months of the present was 41,510 bales against 8,410 in the same period last year: increase in 1840, 33,100 bales.

Taken for Consumption.—In the first six months of 1840, the quantity taken for consumption was 640,700 bales: during the same period in 1839, 394,800. The increase amounts, therefore, to 245,900 bales, or upwards of 9,400 bales per week. The total consumption, since the 1st of January, has been at the rate of upwards of 24,000 bales per week; showing a striking increase in the consumption from January to July 1840, compared with the consumption during the same period in 1839.

Stock.—Notwithstanding the increase in the import this year, the increase in the consumption and in the export has not only absorbed it, but has even reduced the stock by 98,400 bales. On the 1st of July, 1839, the stock amounted to 533,400 bales: on the 1st of July, 1840, to 435,000 only; showing a decrease of not less than 98,400 bales.

Taken on Speculation.—Speculators took, in the last year, 201,720 bales: this year, up to the 1st of July, they had taken 109,950. So that, notwithstanding the heavy import in 1840, the low price of the staple, in conjunction with the decrease in the stock, in consequence of the increased quantity taken for export and consumption, has induced very extensive speculation in cotton up to the present period. In the week which closed on Friday last, not less than 16,500 bales were taken by speculators. Should these gentlemen continue active throughout the year, at its close, the export and consumption continuing at the present rate, a very large proportion of the whole stock of the choicest qualities of the staple will be in their hands.

Prices.—The current prices on the 1st of July, 1840, were much lower, in almost every description of cotton, than at the correspondent period of 1839.

Low prices have produced the usual effect in increasing consumption, which, if it continue during the next six months at the same rate it has exhibited during the preceding, the total quantity consumed will considerably exceed the greatest quantity ever consumed in any one year since the commencement of the cotton manufacture of Great Britain. —*Liverpool Albion.*

THE NEW WOOD PAVEMENT.

In the wood pavings, the exceedingly small wear has been a feature as remarkable as it was unexpected. We all anticipated that the surface of so soft a body as deal, would never have stood the heavy weight it appears to do, at so insignificant a cost of repair. The general opinion was, that the surface would wear into holes, and quickly give way; on the contrary, the wood has worn with great evenness, and wherever the subsoil has been good, the surface has continued nearly as uniform as when it was laid. It is, however, next to impossible to obtain a bottom equally hard in every part, and in that case, if the blocks are not pinned together —and pinned in such a manner as to give the least possible strain on the pins—the inevitable consequence must be a subsiding of those where the substratum is less hard, followed by a rough uneven surface. Instances of this kind have occurred in the Old Bailey, and Hay-hill, leading into Berkeley-square, which were laid with hexagonal blocks. The former, we understand, have been taken up and relaid, and the same is now doing with the latter, which are evident proofs of the system on which they were laid being had.

The great failing feature in the hexagonal blocks is, besides the want of pins and proper dependence one on the other, the clumsiness of the joints. The blocks, we believe, are hewn into shape, as sawing them truly would probably be too expensive. On this account the joints are open and filled with dirt, which, in wet weather, is constantly working up, and rendering the surface unpleasantly slippery. An evident proof of this is in the Strand, where the blocks have all been obliged to be cobbled and repaired before they had been laid down a week. This fault is avoided in the Metropolitan Company's, by having the sides square and parallel to each other, which admit a close joint, and keep out the offending matter.

In the plan of the metropolitan patent wood, we understand the wooden blocks are laid on concrete floorings, to give still further advantages to their form and method of pinning. A greater expense is thus incurred at first, but it tells in the end. Thus for instance, the company offer to keep their pavement in repair, with the travelling in Oxford-street, for 2s. 6d. per square yard per annum, while under the plan of a macadamised road we understand the cleansing alone amounts to £1,400 per annum, or near 1s. per square yard, and the annual repair to £5,000, or 3s. 6d. per square yard more, making in all 4s. 6d., or nearly double that of the proffered offer to keep the wood in repair.

Again, as to the first outlay. The price proposed to be charged by the above company, is somewhere about 12s. 6d. or 13s. per square yard for laying the pavement, with the concrete flooring complete. Compared with the other wood, the hexagonal, which was, we hear, 9s., we confess we thought this high, though it was low in comparison with the advertised price, 14s., of the Imperial, and not a half of what we hear that by St. Clement's church cost, that is, 32s. But it is not the first cost which is the test of expense. Durability is a far more important object. One pavement might be dear at 9s., while another would be cheap at £1. If, for instance, a pavement could be laid at 9s. which would last a year, it would be much cheaper to give £1 for one that would last five years.

Now, those who have experience in these matters assert, that nothing but tooled granite laid in concrete will, in point of wear, compete with good wood pavement, and from what we have seen in Oxford-street, this does appear to be the case. If so, there can be no doubt of the superiority of wood, and that the entire of the capital will, before long, be paved with it; for the very annual saving would, in a short time, amount to the cost of relaying with wood. In Oxford-street, under 2½ years' cost of repairs would do it, while, in the meantime, they would enjoy all the advantages of a 2½ years earlier cessation of that noise, dust, and dirt, which it is the object of wood to avoid.

The city authorities who have the superintendence of Blackfriars-bridge, would do well to ascertain whether wood pavement can be applied either to the bridge or the approaches. We are not sure that it would succeed upon an inclined plane, but the subject should be well considered before Blackfriars-bridge is repaved, as it is clear that the wooden will very shortly supersede all other pavement.—*Railway Magazine.*

RAILWAY INTELLIGENCE,
DOMESTIC AND FOREIGN.

The Gloucester and Birmingham Railway has been in active operation the whole of the week, the passengers and traffic steadily increasing, and having, in the short space of ten days, nearly if not quite doubled in number and amount; from sixty to eighty passengers per diem are now the average of arrivals and departures. The Lansdowne Station is at present quite "the lion" of the town, and presents such a scene of bustle and activity as is perfectly new to Cheltenham. The trains, both up and down, have kept time remarkably well, and though things are in a very unfinished state at and about the offices, the utmost order and regularity appears to have been attained in the engineering and locomotive departments.—*Cheltenham Looker-on.*

The Receipts of the Blackwall Railway for the week ending the 12th inst., are stated at £655. There are only half-hour trains at present, in consequence of one line only being open. The number of passengers carried was nearly 50,000, and crowds unable to find places. No goods are carried yet. The second line is to be opened next week, when trains will start every twelve minutes, and steamers will then ply to and from Blackwall to Woolwich, Gravesend, &c.

The Glasgow and Paisley Joint Railway was opened to-day in the most satisfactory manner.—*Glasgow Chronicle of Monday.*

Slamannan Railway.—This line of railway, which is of great importance to the consumers of coal in Edinburgh and Glasgow, and the intervening country, has just been completed. This railway is an extension of the Garnkirk and Ballochney Railway, from the neighborhood of Airdrie to the Avon aqueduct on the Union Canal, near Linlithgow, and is in length about thirteen miles. It traverses a district abounding in minerals of all kinds, coal, limestone, and ironstone, and will be the means of opening up new sources of supply, which must greatly tend to keep down the price of those useful articles of daily consumption. The coals already sent into Edinburgh, are of a very superior quality. We understand that when a few necessary arrangements have been made, a public opening of the railway is to take place, after which it is intended to run passenger carriages to Glasgow, in connection with the Union Canal, and coaches from Edinburgh to its eastern terminus, for which purpose some very splendid locomotive engines and passenger carriages are being provided.—*Glasgow Courier.*

Falling of a Bridge on the Lancaster and Preston Railway.—One of those annoyances incidental to the opening of lines of railway where due time is not afforded for giving proper stability and consolidation to the works, occurred on the Lancaster and Preston Junction Railway, about seven o'clock on the morning of Tuesday last, after the heavy rains of Monday and Monday night, by the falling in of part of the arch of the White Horse Tunnel, which carries the great North road over the railway, six miles from Preston. Fortunately no lives were lost, or bodily injury sustained, by the accident; neither was there any delay occasioned to the public using the highway, as from the length of the arching the contractors were enabled to pass carriages over the southern end of the bridge, which remains firm, and which, for further security, they covered over with long and substantial baulks of timber.—*Preston Chronicle.*

Accident on the Eastern Counties Railway.—On Monday, between the hours of eleven and twelve o'clock, an accident took place on the Eastern Counties Railway. One of the up-coming trains, consisting of eighteen carriages, a few minutes after leaving the Stratford station, was thrown off the rails, owing to one of the rails being improperly placed. The force of the steam being instantly turned off, the front of the engine stuck fast in the earth, and the train immediately stopped without any damage. Another engine shortly afterwards came up, and took the train in safety to the terminus at Shoreditch.

RAILWAY TAXATION, &c.

FOURTH REPORT.

The select committee appointed to inquire into the state of communication by railways, to whom several petitions were referred; and who were empowered to report their opinion and observations, together with the minutes of evidence taken before them, from time to time, to the House; have further considered the matters to them referred, and have agreed to the following report:—

A considerable number of petitions have been referred to your committee, suggesting the justice and expediency of altering the present system on which railway passengers are taxed.

Much evidence upon this subject was collected by the committee on railways during the last session of Parliament, and your committee have also entered fully into the same inquiry, from both which inquiries your committee are satisfied that this question is of great importance to the public at large, and especially to the poorer classes of the community, and that in proportion as railway communication is extended through the country, the unequal pressure of this tax will be more severely felt, inasmuch as it will be found to limit the accommodation which railways might otherwise beneficially afford to the laboring classes.

The great advantage which would result to these classes from the establishment of railway communication, was repeatedly urged as an argument in favor of these undertakings. To convey the laborer cheaply and rapidly to that spot where his labor might be most highly remunerated, was frequently stated to be one great benefit which would be derived from opening these new channels of intercourse, while it was added that the health and enjoyment of the mechanics, artisans, and poor inhabitants of the large towns, would be promoted by the facility with which they would be enabled to remove themselves or their families into healthier districts and less crowded habitations. Your committee believe that Parliament would deeply regret to find that the tax imposed on railway passengers had a tendency to deprive the laboring classes of these promised advantages, and especially when it is seen that in those parts of the country where the pressure of this tax is most severely felt, the revenue derived from it is insignificant in amount.

The income derived from the duty on railway passengers during the last six years has been, in the years ending

5th January	1835	£ 6,852
	1836	8,693
	1837	10,296
	1838	16,892
	1839	39,570
	1840	72,716

A reference to the appendix will show that of the sum of £72,000 derived from this tax during the last year, £53,000 was received from the five following lines, namely, the Grand Junction, Great Western, Liverpool and Manchester, London and Birmingham, London and Southampton; so that those railways in Scotland and in the North of England which derive their income, as connected with the conveyance of passengers, chiefly from the poorer classes of society, and which suffer most from the present tax, contribute in a very small proportion to the revenue.

The effects of the present system of taxation are very clearly pointed out by witnesses practically conversant with railway communication.

The present duty on railway passengers is fixed by the Act 2 and 3 William IV., c. 120, which states that "the proprietor or company of proprietors of every railway along which any passenger shall be conveyed for hire, shall pay for all such passengers at the rate of one halfpenny per mile for every four passengers so conveyed."

Every passenger, therefore, whatever may be his fare, is taxed to the amount of one-eighth of a penny per mile. It is obvious, that while the tax is the same on each passenger, the proportion which it bears to the fares of different classes of passengers, must vary considerably. The operation of this tax is well illustrated in the observations of Mr. Smith, the assessor of stage-coach duties: "Suppose a line of 120 miles and three classes of carriages; suppose the first-class fare to be 3d. per mile, or 30s., the second class to be 20s., the third class to be 10s., the duty on each passenger would be 15d." This is a large proportion on the lowest fare, and its effect must be to prevent railway directors reducing their charges for the accommodation of the poorer class of passengers. A comparison of the mileage duty with the fares of different railways will be found in the appendix, from which it will be seen that the proportion of the mileage duty to the fares on the London and Birmingham is 1-22d, while on some of the Scotch railways it amounts to 1-10th, and in one case even to 1-6th.

By examining the fares actually paid on different railways, it will be found that while, in some cases, the first-class passenger pays a tax of only 3¼ per cent. on his fare, the third-class passenger is taxed 12, and in some cases 15 per cent.

This inequality of taxation tends materially to diminish the profits arising from the third-class passengers, and thereby operates as a discouragement to railway companies giving that acommodation which the laboring class might otherwise derive from railways. The real hardship of this result deserves the greater attention on the part of the Legislature, because railway communication has superseded, and in many cases destroyed, the conveyance by means of wagons, vans, and carts, which afforded a cheap though dilatory mode of travelling to the laborer and his family. How much the poorest members of society are interested in some alteration of the present duty, may be seen by referring to the evidence of Captain Lawes, in regard to the handloom weavers, and also in the answer of Mr. Lindsay Carnegie, and other gentlemen connected with the Scotch railways, from whose statements it appears that the tax will, on some of these lines, almost put an end to the passenger traffic, inasmuch as the railway directors must raise their fares to an amount which will exclude the chief part of the present passengers from the line. The pressure of this tax is now for the first time felt on many lines of railway, because, in former years, the Lords of the Treasury have exercised a power given to them by the Act 2 and 3 Will. 4, c. 120, and have allowed many of the Scotch and some of the English railways to pay an annual composition in lieu of this tax. This indulgence, however, which was a great accommodation to companies opening railway communications in the poorer districts of the country, is now no longer granted, and your committee see many objections to the future exercise of such a power by the Treasury.

In considering the question of railway taxation, Parliament ought not to overlook the facts which were elicited by the inquiries of the committee of last session, and which tend materially to increase the objections to a continuance of the present system. It was stated by the chairman and deputy chairman of the Leeds and Selby Railway, that, in the year 1836, they raised the fares on that line to an amount which diminished greatly the number of passengers; but they added that, by this increase of fare, although they lessened their number of passengers by 12,000 in the year, yet they augmented their profits by £1,300. Evidence to the same effect has also been given by the chairman of the Bolton and Bury Railway; and a reference to the returns of some of the railways, contained in the appendix, will further prove the same fact.

Whenever the interests of railway proprietors and of the public are at variance, it is probable that the community will be in some degree restricted from the benefits which railway communication is capable

of affording. Your committee, therefore, believe it to be inexpedient to continue a system of taxation which tends to separate the interests of the railway companies and of the public, and which will gradually exclude a great number of persons from the benefit of cheap conveyance.

Two modes of altering the present system taxation have been proposed, by which the inconvenience above mentioned would be removed.

One suggestion is to substitute a per-centage on the gross receipts derived from passengers, in lieu of the present tax. The assessor of stage-coach duties, an officer in the Department of Stamps and Taxes, has stated that five per cent. on the gross receipts derived from passengers, would produce about the same amount of revenue as is raised under the present system. This would relieve railway companies from that inequality of which many complain; and several of the petitions referred to your committee recommend this as the best course which could be adopted.

Another suggestion has, however, been offered to your committee, which would be much more favorable to the interests of the public, namely, to establish a graduated scale of taxation, by which the amount of the tax should be made immediately dependent on the amount of the fare; the great advantage of such a system would be that it would act as a check on high fares, and would hold out an inducement to railway companies to accommodate every portion of the community.

A scale of graduation has been submitted to your committee by Captain Lawes, which will serve to illustrate this plan. Many railway companies are limited by Act of Parliament to a maximum charge of 3½d. per mile for a passenger. Captain Lawes proposes, that on all fares exceeding 70 per cent. of the maximum allowed by the Act, a duty of 10 per cent. should be levied; on all fares exceeding 40 and under 70 per cent., a duty of 5 per cent. should be levied; on all fares below 40 per cent., a duty of 2½ per cent. should be levied.

Mr. Wickham, the chairman of the Stamps and Taxes, stated his objection to the plan to arise from a belief that such a graduated scale would be evaded, and that the revenue would suffer a loss, or at least would not receive the increase which may be expected from a continuance of the present system.

According to the calculations made by Mr. Smith upon the accounts rendered to your committee by several railway companies, it appears that there would be a considerable increase of duty by the adoption of the proposed scale.

Your committee have examined into the different objections urged against a graduated scale, which are, the danger of fraud, by which the revenue might suffer, and the difficulty of collecting duties varying in proportion to the fare.

It is the interest of every company that all its accounts should be kept in a clear and intelligible form, and in this respect the interests of the company and of the government are identical; under a proper system of accounts it does not appear to your committee that frauds could be practised without detection, and the mode of issuing tickets adduced by Mr. Edmonstone, or some similar method, would afford considerable facility for the introduction of a graduated scale of duty.

Your committee do not recommend that the scale proposed by Capt. Lawes should be adopted, because they think that the duty of 10 per cent. would be too high; but they would recommend that, wherever no maximum has been fixed by Act of Parliament, 3½d. per mile should be considered to be the maximum, for the purpose of this graduated taxation; and that on all fares exceeding 70 per cent. of this maximum, a duty of 7½ per cent. should be levied; on all fares exceeding 40 and under 70 per cent., a duty of 5 per cent. should be levied; and on all fares below 40 per cent. a duty of 2½ per cent. should be levied. They believe that a scale thus graduated would be found more just than the present system, and that, while it would not diminish the revenue, it would afford relief and continued accommodation to the poorer classes of the community.

Your committee would further suggest, that if it be expedient that such an alteration should be made, it is desirable that it should be carried into effect with as little delay as possible, because every alteration in the principle of a tax becomes more difficult in proportion to the extension of the traffic to which it applies; the traffic itself is thereby more deranged, and especially in this case it is expedient, that in those districts where railways have been allowed to compound for the existing tax, a substitution to the graduated scale should enable them still to afford accommodation to the laboring classes, before they have been induced to abandon their present system of cheap conveyance.

Two other subjects have been incidentally brought under the notice of your committee, on which they are desirous of offering a few observations to the House.

The rapid conveyance of troops from one part of the country to another, is occasionally an object of great national importance; and, for this purpose, provision is annually made in the Mutiny Act, whereby in cases of emergency "all justices are required within their several jurisdictions to issue their warrants for the provision not only of wagons, wains, carts, and cars, kept by or belonging to any person, and for any use whatsoever; but also of saddle-horses, coaches, post-chaises, chaises, and other four-wheeled carriages kept for hire, and also of boats, barges, and other vessels used for the transport of any commodities whatsoever upon any canal or navigable river." Your Committee recommend that similar powers should be taken with regard to rail-way conveyance, on payment of a reasonable sum, in consideration of the accommodation required. * * *

[Here follow some remarks by the Committee on the advantages of communication by *an electric telegraph*; these we extracted, and inserted in our last.]

Your Committee are of opinion, that circumstances may arise in which it may be very inconvenient to leave in the hands of a private company, or possibly of an individual, the exclusive means of intelligence which this *telegraph* will afford; and it cannot fail to be of paramount importance, that the Government should be furnished with similar means of procuring and transmitting intelligence; and they believe that no railway company will object on fair terms to give every facility to the Government for establishing a line of electrical communication over the whole length of their railway.

Your committee are aware, that they have not fully developed the great and increasing importance of this subject, which perhaps does not fall strictly within the terms of the subject-matter referred to them, but they are most anxious to fix the attention of the House and of the public on a discovery which is no less susceptible of useful than of dangerous application.

July 2, 1840.

COMMON PLEAS—Friday, July 3, 1840.

Before the Right Hon. Lord Chief Justice Tindal.

BAIRD *v.* ROBERTSON, LATE SECRETARY TO THE EASTERN COUNTIES RAILWAY COMPANY.

In our last week's Paper we gave a short abstract of this trial, with the verdict of the jury, which we copied in the exact words of the report, as given by our contemporary, the *Railway Magazine*. On Tuesday last, we received the subjoined letter on the subject, from Mr. John Evans, who we presume to be the solicitor of Mr. Robertson:—

To the Proprietors of the "Inventors' Advocate."

Gentlemen.—In the *Inventors' Advocate* of the 11th inst. there is a notice of the trial of this cause, of so improper a character, that I am willing to suppose its insertion (at least in the shape in which it appears) was the result of inadvertence.

It is stated that the sum of £400 paid by the plaintiff into defendant's hands, had been appropriated by the defendant in an improper manner.

The facts proved at the trial were, that the money in question was placed in the hands of Mr. Robertson as a stakeholder between the plaintiff and the Eastern Counties Railway Company; and the defence was grounded on the belief that the plaintiff had no right whatever to the money, and that he had permitted the use of his name for the purposes of the company, against whom Mr. Robertson claims a large balance, after giving credit for the £400 in question. If the company had had the manliness to sue in its own name, this defence would have been available to my client, who was precluded from urging his claim against the company, in an action brought against him, ostensibly, by a third party.

No imputation of misappropriation was made at the trial, nor would the facts, if properly stated, bear out the offensive complexion, which is, either by accident or design, given to them by your notice.

I have, therefore, on behalf of Mr. Robertson, to request such an explanation of the objectionable notice alluded to, as will be satisfactory.

I am, Gentlemen, your's obediently,

Jno. Evans.

53, Lincoln's Inn Fields,
July 13th, 1840.

In the above communication, Mr. Evans, on behalf of Mr. Robertson, very properly supposes that we had no object beyond giving a fair report of the trial; and to prove that such was the case, we willingly assign, though it occupies a considerable space in our Paper, a place for the insertion of the whole report, *literatim et verbatim*, as given in the columns of our contemporary. By this course, we put our readers in possession of all the facts of the case, and we conceive are doing justice to Mr. Robertson in the way most agreeable to himself:—

Serjeant Chamell, in opening the case for the plaintiff, said:—In stating this case to your Lordship, I must first observe that the plaintiff is a gentleman of the name of Baird, who some time since entered into an agreement with a Mr. Wright residing at Liverpool, under which he secured to himself a certain amount of property, and became registered in respect of 200 shares in the Eastern Counties Railway Company. He at the same time instructed a gentleman of the name of Blakey to call at the offices of the said Company, and pay a certain sum of money which was due on these shares, and get himself registered as a proprietor of such shares. It so turned out, that the defendant was not ready to admit the claim, and disputed plaintiff's right to the possession of the shares. The money due upon the two calls of the 200 shares, was refused on that account. A dispute arose upon the point, and an agreement was at length come to, on which it was stipulated that Robertson should act as a stakeholder between the parties, and receive the £400 upon the terms agreed to, in a memorandum of agreement which was made between the parties. It would also seem, that on the 28th of April Baird addressed a letter to Robertson in town, from Liverpool, in which different communications were made tending to enforce that agreement. Now, Robertson, as it appears most clearly from this letter, having received the money, ratified the agreement on his part, by a document dated the 26th of April, 1838, in which he says "I accept the money so deposited:" and the money was accordingly paid by cheque upon the bankers. Now the first statement of the defendant is, that he never received this money; and a plea is entered to raise this question, namely, that the money was paid him as secretary, and not in his individual character. Now you observe, gentlemen of the jury, that this Robertson was Secretary at the time he received this. Some time after, his conduct caused his dis-

charge, and gave dissatisfaction to the Board of Directors. I, however, do not enter at all into that question, as to whether it was satisfactory or not; it is plain, however, that he acted as secretary at the time. The Directors then employed one Patrick Johnston, to investigate the accounts, and ascertain how matters stood. After this, a letter was written to Robertson, to know whether any money had been paid into his hands. This was answered by a letter from Robertson, in which he states, that, to the best of his recollection, the only sum which came into his possession was "£400, deposited with him by a person whose name he forgets, as in trust, for him, on the one part;" and so far, you see, he describes himself here as a stakeholder between Baird the claimant on the one hand, and the Company on the other, according to an agreement which, it was stated, describes the transaction, which will be found amongst the Company's papers. In consequence of this, the Company's papers were searched; and the result was, that this document was found, transmitted by Baird from Liverpool to Robertson in London, at the offices of the company. Now, the defendant asserts that he received this money as secretary to the Company; not upon his own responsibility. He describes himself as reserving it in trust, between the claimant on the one hand, and the Company on the other. Now a test may at once be put to that. If the money was received by him as secretary of the Company, it was a duty incumbent upon him to pay it into the bankers of the Company. Now, Robertson, at this time, had a private account with the Bloomsbury branch of the London and Westminster Bank. This cheque was sent there, and paid over to his own individual credit, so long ago as 1838. His next defence is, that he has paid it over. Why it is plainly proved, the circumstances show that he has not paid it over, which I believe will be shown on an investigation of the accounts. He is asked whether he received any sums on account, and entered them in the books; and then he says, that, to "the best of his recollection, knowledge, and belief the only sum which he did not enter on the books was one of £400," and that he had forgotten the name of the person who deposited it. A demand was made by the solicitors upon Robertson, by letter, dated 24th of April, which was in the nature of a legal demand for this money. I now beg leave to call upon one of the witnesses subpœnaed in this case.

Nathaniel Davis, Accountant to the Eastern Counties Railway Company, then answered the following questions in rotation:—

I believe you are an accountant?—Yes, I am.

Do you know defendant Robertson?—I do; he was formerly secretary to the Eastern Counties Railway Company.

Do you recollect about what time he ceased to be secretary?—About the month of February, 1839.

After he left, was any one employed in investigating the accounts?—There was.

Did you assist in going through them?—I did.

Do you know Robertson's handwriting?—Perfectly well.

(A letter was handed to the witness, who immediately recognised the defendant's signature.)

Did you find that letter among the Company's papers, and when?—I found it between the months of November, 1838, and February and March, 1839, but cannot say precisely.

Now, on looking through the accounts, does it appear that Robertson ever paid £400 to the credit of the Company?—Most decidedly not.

Does it appear by the books, whether or not the plaintiff received his proper shares?—It does not.

The learned counsel then closed his questions.

Serjeant LEWIS, counsel for defendant, then asked:—

Were you employed, Mr. Davis, at the time that Robertson was secretary?—I was.

Was Mr. Johnston employed at that time?—Yes.

About what time were the accounts investigated?—About October, 1838.

When did Robertson cease to be secretary?—In the month of November, 1839—in the latter part of it.

Have you ever seen Baird?—I don't think I have; I am not quite certain. I may have seen him, but never spoke to him.

By whose direction did you come here as witness?—I was subpœnaed by the defendant.

Who are the attornies for the Eastern Counties Railway?—Roy, Blunt, Duncan, and Johnstone.

Do they conduct this case?—I don't suppose they know any thing of it. I am sure they don't, on the contrary.

When was application made to you for this paper?—About a fortnight or three weeks ago.

Was it by Baird, or his attorney?—By a Mr. Faulkner.

Personally?—Yes.

Had you it in your possession long before?—Decidedly so.

Did Roy, Blunt, and Co., give you any directions, to your knowledge, to search the papers of the Company?—They never spoke to me.

I want to know whether, of your knowledge, any search was made?—None was made by them.

Is that the handwriting of the attornies of the Company?—I don't know their handwriting at all, but I should say not.

Have you seen their writing come into your office at all?—No, and I'll tell you why. Not being the secretary, their communications did not come to me.

Now, was there any application made to search the papers of the Eastern Counties Railway Company, on or before the 8th July, 1840?—Not to myself, certainly not.

Have you the custody of the papers?—The papers were in my custody, as a matter of course, being connected with the accounts.

When Robertson ceased to be secretary, who had the papers?—Mr. Bulkely, or he ought to have had them.

How came these papers in your custody?—As belonging to the accounts.

If there had been any agreement with reference to £400, distinct from this letter, would that have been the business of the accountant?—I don't know; it might have been.

You have seen none, have you?—Not to my knowledge; I do not remember any thing of the kind.

Serjeant CHAMELL then directed the judges' clerk to read the following extract from a letter dated the 20th of April, 1838, addressed to James Baird, and signed, J. C. Robertson, Eastern Counties Railway Company.

"Sir,—Mr. Wright has given the following explanation respecting his shares. He paid £400 deposit on 100 shares, at the Manchester and Liverpool District Bank, on the 2d of April, 1836, which shares are part of the claim. The Bank receipt was tendered to me, but is for the present mislaid. He had also another 100 shares, for which £100 deposit was remitted to yourself in a draft upon Grote, Prescott, and Co., 8th March, 1836. In this I have no interest. With best acknowledgments for your indulgence, I remain yours, &c.,

"J. C. ROBERTSON."

There is also a memorandum, which states "Mr. Jas. Baird has deposited with me the sum of £400, on account of 200 shares, for which he claims to be registered, on condition that Mr. Baird is to accept back the money so deposited if he cannot substantiate, to the satisfaction of the Board of Directors, his claim to be registered for that sum." The learned Serjeant then stated, that a gentleman of the name of Charles Reeve, from the Bloomsbury Branch Bank, was present, as a witness for the plaintiff, who could prove that the check was carried to Robertson's private account, at his bankers. The learned counsel then put the following questions:—

Pray what are you?—I am cashier at the London and Westminster Bank.

Has the London and Westminster Bank a branch at Bloomsbury?—Yes, they have.

Were you cashier there in April, 1838?—I was.

Had Robertson a private account there at the time?—Yes.

Will you turn to his account, and tell me when the cheque was paid into your house?—On the 27th of April.

The witness then withdrew.

Serjeant LEWIS.—I wish to ask Mr. Davis if Mr. Johnston is here?

Mr. Davis.—Yes, he is.

Was he an accountant of the Company?—Yes; he was engaged by the Company as accountant.

Patrick Johnston then answered the following interrogatories made by Serjeant JERVIS:—

You are one of the official assignees of the Court of Bankruptcy, and by business an accountant; are you not?—Yes; I have taken the investigation of some of these affairs.

Do you remember being requested by the Eastern Counties Railway Company to investigate the accounts of the late secretary Robertson?—I was requested to investigate the accounts generally.

Serjeant CHAMELL.—Do you remember addressing a letter to Robertson in December, 1839?—I do.

Have you a copy of it?—I have.

[A letter was then handed in and read, dated the 24th December, bearing the signature of Robertson, addressed to Patrick Johnston, Esq., alluding to the £400 as the only sum defendant had received, he having forgotten the name of the depositor, and to the same purport throughout as the one previously read].

Serjeant JERVIS.—Have you gone over all the accounts of the Eastern Counties Railway Company?—I have gone over them to the 4th of July, 1836.

Then have you not continued the investigation of the accounts up to the time that Robertson left the employment of the company?—I have not.

Have you investigated his account with the Company?—I have not; subsequently to the 4th July, 1836, I have not investigated them. I have seen them cursorily.

Do you not know that Robertson claims a large balance from the Company?—No.

You never heard it from him?—No.

Did he not make a claim against the Company?—I have seen Robertson once or twice on the matters of the Company, with a view to obtain from him the fullest information; and at the time, I stated to him that what he said in the investigation should be without prejudice, and I presume therefore that anything that passed verbally between Robertson and myself I am not at liberty to repeat.

Did that take place before you wrote the letter of inquiry, to which he gave an answer?—It did.

Was that done in the same spirit?—Certainly not. I believe Robertson understood that written communications were different.

Do you know whether Robertson gave credit to the Company for £400?—I have not sufficiently investigated the books of the Company to answer that question.

Has Davis taken up the accounts to the present time?—Davis has been employed as accountant for the company at a yearly salary. I was called in by the Company, and Davis investigated the accounts with me as my clerk.

Who has carried on the investigation from that time?—I cannot answer that question.

I will ask Davis. Up to what time, Mr. Davis, have you carried your investigation?—Davis: Up to the present time.

Then you know of the account between Robertson and the Company?—There is none between them in the books.

Has he not had an account with the Company?—I have never seen one.

Have you seen all the papers?—I have seen all but one from him.

Have you investigated any claim he made?—No; neither do I think he has one.

Do you know that he makes one?—I have never seen one.

Are you quite sure?—Quite positive.

Serjeant CHAMELL.—Do you not know he takes credit for it?

Davis.—Certainly not.

[The demand dated the 24th April, 1840, from Messrs. Clay and Swift to J. C. Robertson, was then handed in and read.]

Serjeant LEWIS, on behalf of the defendant, said —I apprehend the plaintiff has not made out a case. I apprehend that the plea is immaterial here, and does not show the liability of the defendant. I apprehend the letters put in, do not make it out. Even if he had misapplied the money, it cannot at all affect the lisbility of the defendant in respect of the plaintiff. The defendant having a balance against the Company, cannot be charged with this liability. If anything in the way of liability is to be gathered from this case, it is not to be gathered from the conduct of the defendant, or from the correspondence between him and Mr. Johnston, but from what passed at the time that the money was deposited with him, and that is to be collected from the letters themselves. The defendant received the money in the capacity of secretary, and not as a private individual. It would rather appear that the Directors were to be held liable for this money, for the words of the agreement are, "on condition that you accept back the money so deposited if you cannot substantiate satisfactorily to the Board of Directors the claim to be so registered for the same." This proves the transaction to have been done in connexion with his official relation to the Directors. This clearly makes him but the agent of the Directors, and therefore the remedy does not lie against him. I apprehend, therefore, the ground the plaintiff should have taken would have been to sue the Directors. To take the position of my learned friend, he held the money as a stakeholder between two parties. It was to be paid back, on one side or the other, when the conditions upon which it was held were performed. Now there is no evidence that it has not been. This question has been decided very clearly at Nisi Prius, in several cases. Now, how has the failure of the performance of the condition been proved? Davis said that Baird had not been registered; but that is no answer. The grand question is, whether Baird has substantiated his claim. It does not appear it has been. Defendant holds the money on condition that the plaintiff substantiates his claim to the satisfaction of the Directors; and, unless that be shown, I submit that the plaintiff ought to be nonsuited.

Lord Chief Justice TINDAL.—This case may very well be taken in the way suggested by the last letter read. It appears that this money has been received by the defendant under a certain agreement, and the only way of getting at the real truth of the matter is, by considering the meaning of the words of the agreement, "with me—£400 paid to me." His Lordship then left the case to the discretion of the jury.

The jury immediately returned a verdict of £400 damages for the plaintiff.

WINDOW TAX.

The duties, be it observed, are chargeable on all windows in any kitchen, cellar, scullery, buttery, pantry, larder, washbouse, bakehouse, brewhouse, and lodging rooms, whether within, contiguous to, or disjointed from, the dwelling-house. All skylights, and windows or lights, however constructed, in staircases, garrets, cellars, passages, and any other parts of dwelling-houses, are also chargeable, except such interior windows as wholly derive their light from any exterior windows which are duly charged to the said duties. Windows in shops or warehouses, being parts of dwelling-houses, in the front or fronts, and on the ground and basement story, are exempt; but if any such shop or warehouse contains more than three such windows, the remainder are chargeable—the exemption not extending beyond three in any case. According to the 4th and 5th William IV., if any person shall erect any new building, or make any addition to his dwelling-house or premises, or open any communication with any other tenement, or building adjoining, or near thereto, then, and in such case, all the windows in such dwelling-house and premises, and in such new, or additional, or adjoining tenement, or building, are to be rated and assessed together to the said duties, as they would have been before the passing of the said Act.

FUNERAL OF MR. JOHN COCKERILL, OF SERAING.

The funeral of Mr. Cockerill took place at Warsaw on the 27th ult. The coffin was placed on an open car, drawn by six horses, by the side of which walked sixteen young men of the first mercantile houses of Warsaw. The car was followed by the ministers of the Protestant churches, the secretaries and pupils in engineering of Mr. Cockerill, the councillors of state, the governors of the Bank of Poland, the Ministers of Justice, the foreign consuls, the merchants and manufacturers, an immense number of military and civil officers, the workmen of the manufactories, and about six thousand inhabitants of both sexes. On arriving at the burial ground of the Reformed Church, the young men who walked by the side of the funeral-car, carried the coffin on their shoulders to a vault, where it is to remain until the time prescribed by the Sanitary laws shall have passed, when it will be conveyed to Aix-la-Chapelle, according to the desire of Mrs. Cockerill.

GRATUITOUS COPIES

of our Journal have been forwarded to a number of Individuals interested in some Patent, or Invention, of which notice has been taken in our number of to-day.

TO CORRESPONDENTS.

We shall, at all times, be ready to ANSWER QUESTIONS *that may be put to us, relative to any of the subjects indicated in our title; and questions put during the current week, will be replied to either the same, or following week.*

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For the convenience of persons residing in REMOTE PLACES, *the* "INVENTORS' ADVOCATE," *will be regularly issued in* MONTHLY PARTS, *stitched in a handsome wrapper.* PARTS 1 *to* 12, ARE NOW READY.

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TO OUR SUBSCRIBERS.

TWO *numbers of the* "INVENTORS' ADVOCATE" *(Nos.* 48 *and* 49*) were published* July 4. *The former contains, in addition to the usual varied matter, the* TITLE PAGE *and a* COPIOUS INDEX *to the* SECOND VOLUME.

VOLUME II. *of the* "INVENTORS' ADVOCATE," *handsomely bound, is* NOW READY. *A* FEW COPIES *of the* FIRST VOLUME *still remain on hand.*

TO INVENTORS.

ALL PERSONS who may be desirous of TAKING OUT PATENTS, or of bringing VALUABLE INVENTIONS into USE, are requested to APPLY to the PROPRIETORS of "THE INVENTORS' ADVOCATE," (DELIANSON CLARK & CO.) at their "PATENT AGENCY OFFICE FOR ALL COUNTRIES," 39, CHANCERY LANE, where they may be consulted, daily, relative to the PATENT LAWS of GREAT BRITAIN, and ALL OTHER STATES.—(See ADVERTISEMENT on the last page of the present Number.)

THE

INVENTORS' ADVOCATE,

AND

JOURNAL OF INDUSTRY.

SATURDAY, JULY 18, 1840.

We are glad to perceive that the old illiberal notions of commercial policy are rapidly giving place to more enlightened views, even in those continental states which adhere the most firmly to ancient opinions. The French government is taking the lead, and is actively exerting itself to remove the restrictions on the foreign trade of that country, by entering into commercial treaties with most of the other powers of Europe, for the purpose of extending the principles of free trade. Of these treaties, the most important is the one that is on the point of being concluded with England, as it will tend to draw the two countries into a still more close and intimate alliance, and confer mutual benefits on the trade of each. We regret, however, to observe, that some of the French journals endeavor to keep alive the old feeling of national jealousy towards England, and to excite a prejudice against any concession that should admit our manu-

factures more freely into competition with those of France. A sentiment of this kind is not only unsuited to the enlightened course of commercial policy that is now generally admitted to be the best guide to national prosperity, but it contains an extorted admission of the superiority of British manufactures, which enables them to compete advantageously with those of France even in their own markets. This superiority, in several of our principal manufactures at least, it must be borne in mind, may be attributed chiefly to the spirit of competition, produced by the introduction of the principles of free trade. Our silk manufactures, for instance, were scarcely worth notice, as a staple article of the trade of the country, so long as they continued to be fostered like exotics that required the shelter of protecting duties; but when they became exposed to open competition with the silks of foreign countries, the operation of the principles of free trade, which it was feared would exterminate the manufacture in England, proved to be the means of its rapid growth, and of its becoming one of the most important of our national manufactures.

It is only in the very infancy of any manufacturing process, or where it has to contend against natural difficulties, that protecting duties or bounties are of any avail. If the species of manufacture be adapted for the country, the admission of foreign products of the same kind will stimulate the manufacturers to equal their foreign rivals; and the effect of the competition will, in most cases, be to improve the home manufacture of the article, and to place it at least on an equality.

If the principles of free trade be generally beneficial to all countries, they must be peculiarly so to a country that is so pre-eminently distinguished for its manufacturing industry as Great Britain. We may fearlessly throw open our ports to the admission of any foreign manufactures, in the confidence that our mechanical skill, manufacturing industry, and boundless resources, will soon enable us to rival, in the home market at least, the manufacture of any country in the world; and that we shall in a short time be able to compete with them in foreign countries. This principle has, of late years, been generally admitted, and we hail with pleasure any instance in which its practical operation is extended, as in the proposed commercial treaty with France; because every advance towards free trade must, we feel persuaded, increase the prosperity and welfare of this country.

THE EXPLOSIVE FORCE OF HYDROGEN GAS.

The disastrous effects of the explosions of hydrogen gas in our coal mines, prove, beyond a doubt, that a great force is generated by the sudden combustion; and many persons have been induced to turn their attention to the subject, with a view to the application of this force as a moving power. The sudden expansion of gas produced by the explosion, succeeded immediately by a vacuum, presents circumstances that render it apparently peculiarly applicable as a motive power. We were, some time ago, engaged in a series of experiments for the purpose of ascertaining the extent of the explosive force of hydrogen gas. Our object was first, to determine whether the amount of power generated by the explosion of carburetted hydrogen gas was equal to that produced by the combustion of the same quantity of coal from which the gas was distilled, when applied in giving expansive force to steam; and another object we had in view, was to ascertain whether, independently of economical considerations, such a power might not be advantageously employed when great force was required with little weight. Our experiments were not conducted with great accuracy, as we were anxious, in the first place, to obtain some general results; and the quantity of power obtained, compared with the gas consumed, not having answered our expectations, we discontinued further investigations. As the results of our experiments, however, as far as they proceeded, and the mode by which they were obtained, will interest many of our readers, we will proceed to describe them.

The principal point to be determined was, the extent of the expansion of the hydrogen gas during the moment of explosion. The first method we adopted was, to explode a mixture of common air and carburetted hydrogen gas in a confined vessel over water, and to measure the degree of expansion by the quantity of water displaced. For this purpose, we procured a strong tin case, open at the bottom, and at the top of which there was a small hollow square, calculated to hold a cubic inch of gas. Insulated wires were introduced into the hollow square, for the purpose of exploding the gases by an electric spark. The tin case was then filled with water, inverted in a vessel of water, and placed on supports, so as to keep the tin a few inches above the bottom of the vessel. A cubic inch, of an explosive mixture of hydrogen gas and atmospheric air, was then passed up through the water in the tin, to fill the hollow square at the top. The vessel, in which the tin was inverted, was carefully filled to the brim, and placed in another and larger vessel; and the tin was held firmly down on its supports.

It will be perceived from this arrangement, that as soon as the gas in the hollow square was fired, the explosive force would force part of the water out through the open bottom of the tin, and thereby cause the water in the brimful vessel, to overflow. The quantity of water thus displaced, was taken as a measure of the expansive force; and several experiments, performed as carefully as the apparatus would admit, gave nearly the same results, viz., a mixture of one cubic inch of carburetted hydrogen gas and atmospheric air, when exploded, displaced about seven cubic inches of water.

Not being satisfied with this result, and imagining that the contact of water might impair the force of the explosion, we adopted another mode. We procured a gun-barrel, and converted the end of the ramrod into an air-tight piston, that worked easily up and down. A bladder, filled with an explosive mixture of carburetted hydrogen and atmospheric air, communicated with an aperture at the bottom, so that when the piston was drawn up, the space became filled with the gaseous mixture from the bladder. A narrow ribbon was fastened to the top of the ramrod, and passed under a string tied loosely round the gun-barrel, in such a manner that, when the piston was drawn partly out and forced back again, the exact distance to which it had been drawn could be ascertained by the length of the loosened ribbon. The quantity of gas, contained in the lower part of the barrel, could be known by the extent to which the piston was drawn out. The gas was fired, as in the former case, by an electrtc spark: the result was nearly the same as in the preceding experiment, and the piston was not forced by the explosion a greater length than seven times the space occupied by the mixed gas. Immediately after the explosion, it was forced back nearly to the bottom of the barrel, by the pressure of the atmosphere.

It appears, therefore, from these experiments, that the instantaneous explosive force of one cubic inch of carburetted hydrogen gas, mixed with common air, is equal to the force that would be exerted by seven cubic

inches of air compressed into one, and suddenly permitted to expand. The force is, however, only instantaneous; and it is immediately succeeded by another force in an opposite direction, derived from the pressure of the atmosphere acting against the vacuum which the explosion of the gas occasions. When pure hydrogen gas is used, the explosive force is much greater than that of carburetted hydrogen; but we did not prosecute the experiments so as to ascertain the amount of difference.

From the preceding experiments, an estimate may be formed of the comparative forces to be obtained from the explosion of coal gas, and from the heat of the combustion when employed in producing steam. For instance, one pound of coal, it has been found, is sufficient to evaporise 7½lbs. of water, which would give about 172,800 cubic inches of steam of the same pressure as the atmosphere. One pound of the same coal will yield about 5,500 cubic inches of carburetted hydrogen gas. To this quantity of the gas, there may be added about eight parts of atmospheric air, to form the explosive mixture; this would augment the acting quantity to 44,000 cubic inches of explosive gas. Assuming, then, that the explosion causes a vacuum in seven times the space occupied by the exploded gas, we shall have, as a total result from the explosion of the gas distilled from one pound of coal, the production of a vacuum space of 308,000 cubic inches. The same quantity of coal, when employed in evaporating water, produces a vacuum space (supposing the steam to be totally condensed) of only 172,800 cubic inches. It will, therefore, be perceived from this calculation, that the advantage is more than two to one in favor of the explosion of coal gas, independently of the direct force of the explosion, which has not been taken into account in this estimate. If this direct explosive force could be employed in addition to the reaction of the atmosphere on the vacuum it produces, the power gained would be very considerably increased. Our experiments were undertaken principally with the view of ascertaining the direct explosive force of carburetted hydrogen gas; and finding it not so great as we expected the inquiry was not pursued, but it is evident that, if these calculations are well founded, as we believe them to be, there is a much greater power to be obtained from a given quantity of coals, by employing the explosive force of the gas in producing a vacuum, than can be gained by using the same as fuel, for forming low-pressure steam, to produce that effect.

NEW INVENTIONS.

NEW MANUFACTURE.

We have had an opportunity of inspecting the process for manufacturing an entirely new species of tissue and tapestry, which was originally invented or discovered by M. E. Parry, and which, we understand, has been secured by patent, and which, as the material is produced in our own colonies, promises to become an article of great commercial value. In particular, we would refer to some coverings of chairs and tapestry, which have been especially ordered by her Majesty for the palace. It bears so strong a resemblance to silk of the best kind, that it is difficult, without a minute examination, to discover the difference. The material of which it is composed, is the fibre of the banana, aloe, and other trees and plants which are plentifully found in our West India islands, and by very accurate experiments, made by order of the French Government, they have been found on an average to exceed the strength of hemp by one-fourth. The experiments were made at Toulon, upon cordage which had been six months exposed to the air, and an equal time immersed in the sea. We understand that the French Minister of Marine has introduced ropes and cables made of this material, into the Royal Navy, and as it is so much superior to hemp, we see no reason why it might not be advantageously employed in the cordage of the military and commercial navy of this country. —*Post.*

NEW PLANING MACHINE.

We lately had the pleasure of seeing in operation a new and very curious, as well as effective machine for planing iron, invented and constructed by Mr. Rennoldson, of South Shields. The advantage obtained in this machine over others which we have seen, is that it cuts over the whole of the surface of the metal at once, whether it be one inch or twelve inches in breadth, with the greatest ease; by which process, a very great saving in time is, beyond doubt, effected. It is extremely difficult to convey a correct idea of the manner in which this is effected, without the assistance of diagrams. We can state thus far, however: the principal feature in which it is superior to others, is in the chisels or cutters, which are firmly imbedded in an iron roller about fourteen inches in length, and about three and a half inches in diameter. There are eight chisels in the circumference of this roller which extends rather more than half the length. The other end is furnished with an equal number, which likewise extend over a little more than half the length of the roller, and also intersect the position of the cutters in the opposite end, dividing the power which would be required to work it, if the cutters were as long as the roller itself. It is decidedly superior to the point for which a patent has been obtained, as it is calculated to do three times as much work, in a better style, in the same time.—*Tyne Mercury.*

FIRE-PROOF HOUSES.

The attention of Government has lately been called to the importance of rendering the various public buildings now in progress, *fire-proof.* An experiment was given on Thursday by the Fire Preventive Company, at the request and in the presence of Colonel Fanshawe, of the Ordnance, Capt. Jebb, Mr. Sylvester, and other gentlemen, which was equally satisfactory as all the former ones. Two model ceilings were submitted to the action of the same fire; the one prepared with plaster, in the ordinary way was very soon destroyed; but the other, constructed with the patent fire-proof cement, was found, after the fire had subsided, scarcely injured. The gentlemen present, expressed their unqualified approbation, and it appears to us that it only requires that the merits of this valuable invention should be made known to the public, to insure its universal adoption. The composition is alike applicable to ships, and the Lords of the Admiralty have ordered the boat Lucifer, now lying in Woolwich Dock-yard, to be prepared with the fire-preventive cement.

INFRINGEMENT OF A PATENT.

COURT OF EXCHEQUER.—Monday, July 13.

(Adjourned Sittings at Westminster, before Lord Abinger and a Special Jury.)

GILLETT AND ANOTHER *v.* GREEN.

This was an action for the infringement of a patent, under which William Stedman Gillett, of Guilford-street, gentleman, and John Chapman, of Paddington, mechanist, claimed as a new invention "the application of a driving-seat or box (or such like or convenient support for the driver) to the back of such description of two-wheeled one-horse vehicles, as are so constructed that the passengers enter in front, and suitable for cabs." The invention above described is that which is familiarly known as Hanson's patent safety cab, and the plaintiff's complaint was, that the defendant had used their invention without their license.

Mr. Kelly and Mr. Wheatley appeared for the plaintiffs, and Mr. Thomas for the defendant.

The defendant put on the record several pleas, but the evidence adduced on his behalf, and which appeared to be mainly relied on by his counsel, went to establish that the peculiarity described in the plaintiffs' specification had been known and used to some extent for a period of 20 years, whilst the patent on which the plaintiffs relied was not granted until the 21st of December, 1835.

Lord Abinger expressed a strong opinion, that if the jury believed the evidence of the defendant's witnesses, they could not come to the conclusion that the invention upon which the plaintiffs obtained their patent was a novelty.

The jury, however, found all the questions put to them for the plaintiffs, and a general verdict was therefore entered for the plaintiffs—Damages 1s.

Mr. Kelly, for the plaintiffs, put in the record of a former trial, in which the same right was established for the plaintiffs, and which proof, as he contended, entitled the plaintiffs to treble costs under a late statute.

There were two other cases in the paper by the same plaintiffs against other defendants, for an infringement of the same patent, but they were directed to stand over until the conclusion of next term.

FINE ARTS.

SIGNOR SAN GIOVANNI'S SCULPTURES.

The art of modelling miniature figures, and groups of men and animals, has been brought to a higher degree of perfection by this artist, in this country than it ever reached at any former period. In his studio in Nassau-street, Middlesex Hospital, there is now a great variety of designs in a sort of clay, which is as hard as terra cotta, most elaborately modelled, and the inspection of which will repay the visits of the curious and the lovers of art. These designs are full of genius of a high order. Some of them are beautifully conceived, and in all, the execution of the ideas conceived is perfect. There are several very exquisitely-finished busts of the Duke of Wellington, in which the likeness of the great warrior and statesman is preserved with extraordinary fidelity; and the expression and character of the countenance of the original, transferred to the material on which the artist works. There are also likenesses of Her Majesty, Prince Albert, Lord Nelson, &c., equally faithful and spirited. The groups consist of brigands, sportsmen, Greeks,

both male and female, Turkish soldiers and Mamalukes on horseback and on foot, lions, wild boars, and dogs, deer, and wild and tame animals. In animals, this artist has the truth of Mr. E. Landseer, and conveys in his models what that distinguished painter does on the canvass—viz., a correct delineation of nature. In horses he is very happy, and in several of his models he has united just enough of the antique with the English blood horse, to make his horse a classical copy of nature without deviating from fact into mythology. These models are, from their size, adapted for the apartments of modern houses, and are within the capacity of most persons to acquire. They form most beautiful ornaments for the libraries and drawing-rooms of persons of taste and elegance. The artist is deserving of liberal patronage.

A HOLY FAMILY, BY CORREGIO.

There is now on view, by tickets from the proprietor, at 49, Pall-mall, one of the finest specimens of the wonderful genius of the ill-fated Allegri. The subject is merely that portion of his celebrated picture, called "The St. Jerome," which, leaving out the figure of the saint, gives the half-length of the Virgin with the infant on her knee, and Mary Magdalen kneeling and embracing the child's feet: the entire figure of the latter is seen; but of the other two, the lower limbs are not included. But this portion is a complete composition in itself, it does not require any accessorial aids; but whether it was painted by Corregio before the great picture above-named, or was copied from it after that was finished, cannot now be ascertained, nor is it a question of any great importance, as this work possesses all the finer qualities of the larger one, and, in fact, is in a much higher state of preservation. The effect of light, and the glowing though pure and nature-like tone of the flesh tints, are most remarkable; it may be termed the poetry of executive art. The *chiaro 'scuro* is perfectly wonderful—rich, deep, and transparent in the shadows; the light gradually increases, until, having reached its focus, it glows as brilliantly as if irradiated by a sunbeam. The natural and unaffected grace of his females and children are conspicuous in this picture, and these qualities were peculiarly his own, for he appears to have had only nature for his instructor, and the force, relief, and sweetness of his pencil are as evident in this work as in any of his great works which we have seen.

SCIENTIFIC MEMORANDA, AND NOTES ON ART.

Engraving the Daguerreotype Plates.—M. Donné, in a memoir presented to the Academy of Sciences of Paris, at its sitting of the 15th of June, gives the following account of a process for transforming drawings obtained by the Daguerreotype, into engraved plates, in order to obtain the reproduction of those drawings by the common process of copper-plate printing.

The most important point in the application of this process, is the selection of the plates, which should be very smooth. The drawing is to be obtained by the common process of the Daguerreotype, and should be as perfect as possible; the washing is also done in the same manner; with a dilute solution of hyposulphate of soda and water. The plate being well dried, an edging of engravers' wax must be put round it, after which it is placed horizontally over a bason, with the four corners resting on its edge. Nitric acid, diluted in the proportion of three parts of pure acid to four of water, is then poured over the surface of the plate. The proportions of acid and water should be strictly adhered to.

After three or four minutes, the action of the acid begins, first on one point by little bubbles of gas, which soon extend over the whole surface of the plate.

It is difficult to fix the exact time required for the action of the acid, but as it is in all cases very quick, it should not last longer than two or three minutes.

When the drawing is sufficiently bitten in, the acid is poured into the bason; the plate is then to be washed with plenty of water, and lightly wiped with very fine carded cotton, and the operation is finished.

The plate is then to be printed from, in the same way as common copper plates.

Mr. Donné presented to the Academy several of these engraved plates, and a collection of impressions obtained from them.

Improvements in the Mode of Taking Casts by Voltaic Electricity.—Mr. Spencer, in the *Athenæum*, gives the following account of an improvement he has effected in the method of taking casts by voltaic electricity, so as to obviate the necessity of taking previous casts in metal. The following is his description of the process:—

Should I be desirous of obtaining a copper mould, or cast, from a piece of wood, plaster, or clay, or, indeed, any non-metallic material, I proceed as follows:—Suppose it is an engraved wooden block, and I am desirous of metallizing it, in order that I may be able to deposit copper on its surface, (this example will hold good for any other material,) the first operation is to take strong alcohol, in a corked glass vessel, and add to it a piece of phosphorus (a common phial corked will answer the purpose); the vessel must now be placed in hot water for a few minutes, and occasionally shaken. By this means, the alcohol will take up about a 300th of its bulk of phosphorus, and we thus obtain what I would term an alcoholic solution of phosphorus. The next operation is to procure a *weak* solution of nitrate of silver, place it in a flat dish or a saucer; the engraved face of the block must now be dipped in this solution, and let remain for a few seconds, to allow capillary action to draw it into the wood.

This operation being performed, a small portion of the alcoholic solution of phosphorus must now be poured in a capsule or watch-glass, and this placed on a sand-bath, that it may be suffered to evaporate. The block must now be held with its surface over the vapor, and *an immediate* change takes place; the nitrate of silver becomes deoxidised, and gives place to a *metallic* phosphoret of silver, which allows the voltaic deposit to go on with as much rapidity and certainty as the purest silver or copper.

The whole process may be performed in a few minutes, and with absolute certainty of success. The interior or exterior surface of a plaster or clay mould of a statue, no matter what size, may be thus metallized with equal facility.

VARIETIES.

Power of Steam.—The greatest load lifted by any engine now at work in this country, was by one in the Consolidated Mines, which raised a load of 9,000 lbs. every double stroke it made, and did this nine times a minute, amounting to 267,022 tons, lifted 7 ft. 6 in. in twenty-four hours; and this astonishing machine could be started, stopped, or regulated, by a little boy.

Post-office Notice.—A notice has recently been issued by the Post-office authorities, cautioning the public not to trust the conveyance of sovereigns and half-sovereigns in letters, as great risk of loss is incurred; and recommending persons wishing to transmit such coin to obtain a money letter order, which will for the future be granted to the amount of £5, at the General Post-office, the branch offices at Charing-cross, Cavendish-street, and the Borough and at all the receiving houses more than three and under twelve miles from the General Post-office. It is presumed that this order has been made in consequence of the numerous miscarriages of money letters since the New Postage Act came into operation, and the receivers were directed not to take the precautions theretofore used to prevent the loss of such letters.

Rebuilding of the Palace of Justice, at Brussels.—The question of the removal of the Ancient Palace of Justice in Brussels, has been, for some time past, agitated with great animation in that city. The Brussels papers have strongly advocated its being removed to a more convenient part of the city, and that it should be made a handsome building, worthy of and ornamental to Brussels. The common council, however, decided on Saturday last, by a majority of 12 to 7, that it should be rebuilt on its present site. This decision, which was founded on economical views, is strongly condemned by the Brussels press generally, and the majority is regarded as having been unfairly obtained, because seven common-councilmen were not permitted to vote; some technical objection having been made and allowed, to their competency to give a vote on the question.

Norway.—Iron Steam Ship.—It is stated in a letter from Christiana, in Norway, that the first iron steam-boat that had been built in that kingdom, was about to be launched from the ship-building yard of Mr. Samuel Owen, near Stockholm. This vessel, the engines of which are of 480 horses-power, is intended to ply regularly between Stockholm, Copenhagen, Lubeck, and the principal intermediate ports. The proprietors of the vessel have named it after the engineer, *Samuel Owen.*

Protection of Literary Property in Austria.—The *Austrian Observer* announces that a treaty has been concluded between Austria and Piedmont, for the purpose of protecting literary property, and objects of art from piracy; and to maintain the rights of authors and artists. Literature, science, plays, music, painting, sculpture, engraving, lithography, and the public journals, are all comprised in this treaty.

The Frigate, La Belle Poule, which is to be sent to St. Helena, to bring to France the body of Napoleon will take out a daguerreotype, with a great number of plates, for the purpose of obtaining an exact representation of the place where the mortal remains of Napoleon were deposited, and of the spot where he passed the last years of his life.

Flax.—It appears by a comparative statement (just published) of the quantity of flax, &c. imported into Dundee, from the 1st of January to 20th June, 1839, and 1840, that there has been a decrease in the latter year of flax, flax Codilla, and hemp, amounting to 30,327 cwts.

Education in French Prisons.—The French Minister of the Interior, has sent a circular to the prefects of the departments in France, informing them that primary schools are now organised, in all the prisons and houses of correction. In all of them, free schoolmasters have been substituted for the prisoners who were formerly appointed to teach reading and writing. Hitherto the administration has only had in view the instruction of the convicts in matters of practical utility, but it is now determined to place the education of the prisoners on a higher footing, and to employ it as a means of moral reformation. It is not

fitting, observes the *Commerce*, that whilst so much attention is paid to the education of infants and children in our public schools, that this important matter should be neglected in those great establishments, that are occupied by those whom the penal law delivers over to the care of the government.

The Great Western arrived at Bristol on Wednesday, from New York, in 13¼ days. She brings 152 passengers,

Postage Envelope.—A new stamp for the postage envelope is already prepared, to supersede the Mulready landscapes of savages, camels, harrels, and Britannias. It consists simply in a well-executed likeness of the Queen, resembling the label, but circular in form, and is to be printed on the right hand upper corner of the envelopes and covers. Some expense will be incurred by the change.—*Bristol Journal.*

Death of the Hanoverian Court Painter.—M. J. Heinrich Ramberg, the Hanoverian Court painter, has died at the age of nearly 80 years, during the last of which he suffered a very painful illness. He was once deservedly celebrated as a caricaturist and humorist. He lived too long, and worked too much, to retain his reputation to the end of his days. The younger generation, without equalling him, had caused him to be forgotten. He received a considerable salary as Court painter, and as such had nothing to do. It is, therefore, not likely that a successor will be appointed, especially as our city has not at this moment a native artist whose talents would merit so distinguished a post.—*Hamburgh paper.*

Fossil Trees.—There has been discovered by the workmen employed in cutting out the new road leading to the Norham-bridge, on the north side of the Tweed, a number of fossil trees. They appear to be of great antiquity, and do most beautifully illustrate the formation of coal from the remains of vegetable matter, being for the most part incrusted with that substance, and some of it being of the purest kind. The stones are all lying in a horizontal position, and from 10 to 20 feet from the surface. The roots of the trunk cannot be perfectly traced, but the evident appearance of the lamina and of the branches, completely establish their character. The trunks vary in size, but the largest appear to be about five or six feet in diameter. Several gentlemen in the neighborhood have received specimens of what we have every reason to believe has been an antediluvian forest. A number of fossil trunks are yet *in situ*, and may be viewed by any naturalist desirous to see them. —*Berwick Warder.*

Antiquarian Discovery.—A silver seal in fine preservation has recently been found on the grounds of Wade Brown, Esq., at Monkton Farleigh, Wiltshire, near the site of the Priory of St. Mary Magdalene. This relique is a pendant, having a female front face, deeply cut, and of exquisite workmanship (probably Italian); the legend encircling the head "Capvt Marie Magdalene," connects it with the Ancient Priory, which, on Dugdale's authority, was founded by Humphrey de Bohun, about the year 1125, and was among the first of the monastic establishments that fell a sacrifice to the zeal of Henry the Eighth's ecclesiastical commissioners. The Prior, who resigned 26 Henry VIII., A. D. 1535, preparatory to the dissolution of the house, was named Lodowick. It is stated in the Monasticon, that "no seal of the Priory had been found." The foreign name Lodowick, may lead us to infer that the rare specimen of ancient art, thus brought to light, was the seal of the last head of the priory of Monkton Farleigh.

Overland Route to India.—Interesting to Ladies. —The overland route to India has hitherto been almost impracticable to the fair sex, in consequence of the difficulties attendant upon crossing the desert by the ordinary mode of travelling between Alexandria and Suez. We learn, however, that the greatest facility is now afforded even to the most delicate, and least adventurous, by an ingenious invention of Mr. Waghorn, constructed of a carriage peculiarly adapted for the desert, which is built entirely of iron. This carriage will shortly be exhibited before the President of the Board of Control and the Chairman of the Hon. East India Company; and, from what we hear, it is likely to meet with their fullest approval.

Wool from British India.—Of this article, 864 bales have lately been received from Bombay, and, judging from the quality of this shipment, we may with confidence state that it bids fair to become a most important branch of our export. When it is considered that in British India we have millions of sheep, worth about two shillings each, with endless pasture, it will be strange indeed, when the breed is crossed, if we cannot compete successfully in the production of wool, when aided by the British capital, with the rest of the word. It is a fact not generally known, that the principal stock from which Australian sheep have been bred, was derived from India; that from a long period enormous numbers of sheep have been exported annually to Australia; and that numbers are now being daily shipped to the Cape of Good Hope, where one cross with the merino breed improves the wool threepence per pound. To Lord Western are we indebted for the promotion of the improvement of British Indian wool.—Prices current of 864 bales East India wool; Good white, 7½d. to 9¼d. per lb.; white and yellow, 6½d. to 7d.; gray, 4¼d. to 5d.; black, 3d.—*Indian News, No.* 2.

Coal under the New Red Sandstone.—At the last meeting of the Manchester "Geological Society," Mr. E. W. Binney stated the result of the search for coal, instituted by the Duke of Newcastle, in the Worksop manor estate, lately purchased by him of the Duke of Norfolk. The place where the boreings were made, was Lady Ley Quarry, about five miles east of the magnesian limestone, the point nearest which the coal has been worked.

The limestone proved to be.....	49	yards thick.
Lower new red sandstone.....	9	,,
Measures above the grit.....	30	,,
Fine white gritstone sunk.....	26	,,

In the measures between the new red sandstone and the gritstone, two "sound" beds of coal were discovered. This attempt proves that coal is to be found a considerable distance under the new red sandstone formation at a moderate depth, and also that the lower member of this group contains immense volumes of water; the bore-holes in this instance having constantly yielded a stream of water eight inches broad by two deep, ever since this stratum was reached, although only three-inch instruments had been used.

Northern Mails.—On Tuesday, last a deputation of Members of Parliament connected with the northern counties, waited upon Colonel Maberly, Secretary of the General Post Office, to ascertain at what time the London mail to Yorkshire would be conveyed by the North Midland Railway, and the York and North Midland Railway to Leeds and York, and the Post Office communication accelerated by this means to the counties of Durham and Northumberland. In answer to these inquiries, they were informed that the mail would be forwarded direct to Sheffield, Leeds, and York, by the railway trains as soon as the necessary arrangements could be made for that purpose, and that the requisite notices had already been given to the railway companies to effect that object. These arrangements, we believe, will apply both to the morning and evening mails from London. It was explained to the deputation, that, for the convenience of the towns on the roads, the old Edinburgh mail coach would continue to run as usual, and that the mail to Darlington would start from Leeds on the arrival of the mail train at Leeds, and be continued to Newcastle, by which a saving of six hours, at least, will be effected in the postage communication to the places north of Leeds. We understand that it will be about a month before the mails begin to be conveyed on the North Midland Railway and its branches.—*Leeds Paper.*

The Nelson Memorial.—The foundation stone of the splendid granite column about to be erected in Trafalgar-square, London, to the memory of the late gallant hero of Trafalgar, is being prepared at the Haytor Company's works, near Lairabridge; and is to be laid on the 1st of August next, being the anniversary of Nelson's victory of the Nile. It is a stone of large dimensions, containing upwards of 140 cubic feet.—*Globe.*

Paganini's Will.—"The will of Paganini has been opened at Genoa," says a letter from that place in the *Debats*, "and the following account of its contents is given as authentic:—The greater part of the fortune consists in houses and lands; the remainder is in the funds of France, England, and Naples. The total amount has been officially estimated at 1,700,000 francs, which is said to be rather an under than an over estimate. Paganini has left to his eldest sister the life-interest of a capital of 75,000 frs., which is, after her death, to be divided equally between her sons and daughters. To his youngest sister he leaves a life-interest of 50,000 frs., on similar conditions; to a lady of Lucca, whose name the will declares is not to be mentioned, he has left 6,000 frs. a year for life, and to the mother of his son 1,200 frs. for life. This lady is not a Jewess, as has been generally said, but a Roman Catholic, and a distinguished singer, who travelled with Paganini from 1820 to 1823, and sung in nearly all the concerts he gave during that time. The bulk of his property, after deducting the legacies, is bequeathed to his son Achilles, who is by the will placed under the guardianship of Marquis Lorenzo Parato, of Genoa."

Discovery of the Antarctic Continent.—An interesting rather than important geographical discovery has this year been made in the Southern Antarctic Ocean, of an island continent with a coast of 1,700 miles from east to west, but situated so far to the south as 64 to 66; it will be unavailable for tillage or settlement, though highly useful for seal and whale fishery. The most singular coincidence is, that it was discovered by the French and Americans on the same day, June 19, 1840, at the distance of 720 miles from each other. By reference to the map, it will be seen the above discoveries are in the longitude of New South Wales, and a continuation most probably of the same continent; for a series of large islands was discovered in 1830 by Mr. John Briscoe, of the Navy, who, when commanding the brig *Tula*, on a sealing voyage, fell in with the land in lat. 67, long. 50 (that of the Mauritius), and coasted it for 300 miles. He was also driven off by severe weather and icebergs.—*Sydney Herald.*

LITERATURE.

REVIEW OF BOOKS.

The Paris Sketch-book. 2 Vols.

Of the two very amusing volumes which constitute this sketch-book, nearly half the matter has already appeared in different periodicals; nevertheless, that portion is quite good enough to be collected together in the shape of a connected work, and in conjunction with what is entirely novel, to form an excellent continuous series of sketches of the manners and customs of our continental neighbors, of their humors and eccentricities, and of the absurdities, mistakes, and blunders of our countrymen, who occasionally make an invasion of their territory. The contents of the two volumes are diversified, so that there is something to suit all tastes, and, though there

is a broad vein of humor throughout the whole series, there is less caricature than could be expected from a draughtsman who is obviously imbued with a vigorous taste for raillery, and a strong power of seeing and describing the ridiculous. The sketches are the result of close examination, and a talent of expressing, in familiar language, what has been observed. There is a good deal of quiet humor, and much real wit. What is described, is described so closely to natnre, that it would seem, though the writer is by no means deficient in imagination, that he has drawn less on his creative capacity, than on his recollection. The two volumes contain 19 sketches, or distinct narratives of events. From some of these, a good deal of useful information is to be gleaned; and, if experience can be conveyed in books, this book will teach a knowledge that will be useful to many persons on many subjects. The narrative entitled "A Caution to Travellers" is an excellent chapter. It ought to be read by every "bagman" in the empire. An extract from the articles called "Peytel," will show that the Parisians, with all their affectation of refinement, are as coarse in their curiosity as the mobs of vulgar ruffians and shameless prostitutes who formed the spectators of the late execution at Newgate:—

It was Carnival time, and the rumor has pretty generally been carried abroad that Fieschi was to die on that morning. A friend who accompanied me, came many miles through the mud and dark in order to be in at the death. We set out before light, floundering through the muddy Champs Elysées, where, besides, were many other persons floundering, and all bent on the same errand. We passed by the concert of Musard, then held in the Rue St. Honoré, and round this, in the wet, a number of coaches were collected. The ball was just up, and a crowd of people in hideous masquerade, drunk, tired, dirty, dressed in horrible old frippery, and daubed with filthy rouge, were trooping out of the place; tipsy women and men, shrieking, jabbering, gesticulating, as French will do; parties swaggering, staggering forwards, arm-in-arm, reeling to and fro across the street, and yelling songs in chorus. Hundreds of these were bound for the show, and we thought ourselves lucky in finding a vehicle to the execution-place at the Barrière d'Enfer. As we crossed the river, and entered the Rue d'Enfer, crowds of students, black workmen, and more drunken devils from more carnival balls, were filling it, and on the Grand-place, there were thousands of those assembled looking out for Fieschi and his *cortège*. We waited and waited, but, alas! no fun for us that morning; no throat-cutting—no august spectacle of satisfied justice, and the eager spectators were obliged to return disappointed of their expected breakfast of blood!

REPORTS OF SCIENTIFIC MEETINGS

ASHMOLEAN SOCIETY (OXFORD).

June 22. The President in the Chair.

The minutes of the former meeting were read.

The following presents were received from J. O. Halliwell, Esq. F.R.S.:—Catalogue of Miscellaneous MSS. in the Library of the Royal Society; Reliquiæ Antiquæ, Nos. 2 and 3; Warkworth's Chronicle; Life and Writings of Sir Samuel Morland; Notes on the History of the Discovery of the Composition of Water.

The following gentlemen were elected:—

Rev. W. W. Woolcombe, Exeter College.

F. C. Woolcombe, Esq., Balliol College.

Professor Daubeny communicated a Paper on Self-registering Meteorological Instruments. He began by pointing out the importance of obtaining a regular series of observations relating to the weather, with a view to the solution of various practical questions connected with agriculture, rural economy and botany; to the explanation of the causes of local epidemics; to the determination of the laws which govern the distribution of temperature throughout the globe, as well as the occurrence of storms, hurricanes, &c.; and to learn whether that deterioration is taking place in the climate of certain countries which has sometimes been suspected. On these grounds the Professor urged the employment, wherever it was practicable, of self-registering instruments, and pointed out a method for registering the height of the barometer and thermometer during the day by means of a slip of photogenic paper, progressing at a certain rate by means of clock-work, and placed behind the instruments. He then alluded to a plan of his own for registering the intensity of the solar light, and likewise to similar inventions of a less imperfect description, proposed by Mr. Jordan, of Falmouth, and by Sir John Herschel. He next proceeded to point out the construction of Osler's Self-registering Rain Gauge and Anemometer, a model of both which instruments was placed upon the table. These instruments not only measure the amount of rain, and the direction and force of the wind at any particular time, but they even mark the exact period at which a storm of rain or a gust of wind commences, and that at which it terminates. At the recommendation of the Royal Society, these instruments have been taken out by Captain James Ross on his voyage in the Pacific, and they are likewise in action at Edinburgh, at Cambridge, at Birmingham, and at Plymouth. The Professor concluded by expressing his wish that these instruments should be procured for the Ashmolean Society, and set up somewhere within the precincts of the University, where they could be consulted at pleasure, and daily registers kept of the results obtained.

The President, Dr. Buckland, then proposed that a subscription should be set on foot for their purchase, and it was agreed that the list of contributors should be suspended in the Museum, and that Mr. Kirtland should be empowered to receive the names of those persons who might be disposed to assist the undertaking, in addition to those already appended. It was also determined that the model of the instruments should remain for a few days in the Museum for the inspection of the curious.

The Keeper of the Museum gave the following description of book worms:—There are various species of book worms; the one probably most familiar to most of my hearers is the allegorical book worm, man. He is a very voracious devourer, generally in proportion to the extent of his intellect, but he is pantophagous. Those animals I am about to describe to you confine their appetites to the food found in the various materials of books, whether paper, leather, or parchment. They spare neither sacred or profane literature—neither the most pious, the most eloquent, the most learned labours of our most zealous divines, the most sublime musings of our poets, or the most elaborate investigations of our lawyers and critics, the theories and practice of our medical, or the minute researches of our scientific philosophers. All these have in their turns fallen a sacrifice to the depredations of the *Anobium*, the *Dermestes*, and *Lepisma squamatum*, *argenteum*, *cauda triplici*. "How dear are our books," says an eminent naturalist, "our cabinets of the various productions of nature and their collections of prints, and other works of art and science, to the learned, the scientific, and the virtuosi! Even these precious treasures have their insect enemies. The larvæ of *Crambus pinguinalis*, whose ravages in another quarter I have noticed before, will establish itself upon the binding of a book, and spinning a robe which it covers with its own excrement, will do to it no little injury. A mite (*Acarus eruditus*) eats the paste that fastens the paper over the edges of the binding, and so loosens it. I have also observed the caterpillar of another little moth of which I have not ascertained the species, that takes its station in damp old books between the leaves, and there commits great ravages, and many a black letter rarity, which in these days of Bibliomania would have been valued at its weight in gold, has been snatched by these destroyers from the hands of book collectors. The little wood boring beetles, *Anobium pertinax*, and *striatum*, also attack books, and will even bore through several volumes." Mr. Peignot mentions an instance where, in a public library but little frequented, 27 folio volumes were perforated in a straight line by the same insect (probably one of these species) in such a manner that, in passing a cord through the perfect round hole made by it, these twenty-seven volumes could be raised at once. The animals last mentioned also destroy prints and drawings, whether framed or preserved in a portfolio. The *Termes pulsatorius*, which is accused of frightening the timid at night, as the death watch, is also accused of being a depredator of books.

Parnell, in his amusing poem entitled "The Book Worm," thus describes this enemy of literature:—

> "Come hither boy, we'll hunt to-day
> The book worm, ravening beast of prey,
> Produced by parent earth at odds,
> As fame reports it with the gods.
> Him frantic hunger wildly drives,
> Against a thousand authors' lives.
> Through all the fields of wit he flies,
> Dreadful his head with *clustering eyes*.
> With horns without and tusks within,
> And scales to serve him for a skin,
> From leaf to leaf, from song to song,
> He draws his tadpole length along.
> Insatiate brute whose teeth abuse
> The sweetest servants of the muse,
> Nay, never offer to deny,
> I took thee in the *act to fly*."

Poets, as Aikin says, are not natural historians, and therefore are often incorrect in their descriptions of the objects of nature. Where the poet found his "clustered eyes," "his scales," and "tadpole form" in the larvæ which are not come to their "flying state" when they are devourers of books, it would not be easy to discover, except in his own imagination.

Professor Powell reminded the members of the society that, from the experience of former observations, there was a probability of a great number of meteors being visible on the night of the 10th of August, and recommended that due attention should be given to the phenomena connected with them.—*Oxford Herald.*

HORTICULTURAL SOCIETY.

July 7th. Dr. Henderson, V.P., in the Chair.

Dr. Lindley announced that at the last exhibition at the gardens, there had been awarded 4 Knightian medals and 10 gold Banksian medals, 23 large silver medals, making a total of 82. There had also been admitted to the gardens on Saturday, exclusive of exhibitors, 5,071 persons who were admitted by tickets. An account was read of a self-regulating ventilator for green-houses, founded on the principles of the arrangements of Arnott's stove. Dr. Lindley remarked that all these proposals were liable to getting out of repair, as well as these self-regulating movements would not suit always the internal circumstances which a green-house might require. The show of plants, which was not extensive, comprised some interesting varieties, amongst which were some new orchidaceous plants from Mr. Bateman. Mr. Hill, of Hammersmith, exhibited a seedling Albert; and Mr. Hogg, of Paddington, a fine collection of pinks and piccotees; Mr. Chandler, of Vauxhall, exhibited eight varieties of Fuchsia, with a fine new scarlet Geranium. The show for the gardens of the society was also good. The only prize awarded was the silver Knightian medal to Mr. Bateman for his new orchidaceous plants. The extract from the Meteorological Register, kept at the gardens, from the 16th of June to the 7th of July, gave barometer, highest, June 20, 30·207 inches; lowest, July 5, 29·639 inches: thermometer, highest, June 16, 78 Fahr.; lowest, June 24, 44 deg. Fahr.; and quantity of rain 0·80 inches. The Marquis of Ormonde, the Earl of Enniskillen, and several other members were elected.

URANIAN SOCIETY.

At one of the recent meetings of this society it will be remembered that Mr. W. H. White, V. P. read a Paper on "Comets and their supposed Influence on the Atmosphere of the Earth." At that time from particular circumstances we were not able to give a full account of the author's labors. The first recorded facts, describing the path of a comet, were by Peter Appian, Professor of Mathematics to Charles V. and his brother Ferdinand. Appian recorded the appearance of five comets between 1531 and 1539, and stated, that their tails were always turned from the sun. It is, however, to Tycho Brache that we are indebted for the first glimpses of their nature. He carefully observed the phenomena of the comet which appeared in 1577, and gave it as his opinion, that comets are solid, permanent bodies, moving in orbits similar to those of the planets. Since the time of this celebrated astronomer, the elements of about 100 comets have been calculated and handed down to us. The following are a few of the functions of comets:—1st. They pervade all space. 2d, Their velocities, like those of the planets, increase the nearer they approach the sun. 3d. Their magnitudes are exceedingly various; some not exceeding the size of the moon, and others being three or four times the size of our earth. 4th. They are all furnished with luminous tails, or trains, which are always turned from the sun.

Among the smallest of the known comets are those of Encke and Biela; the former performing its revolution round the sun in 1,207 days, and the latter in about 6½ years. These are both tail-less comets, and so small as to be scarcely seen with the naked eye. The comet of 1744 was equal in diameter to the planet Jupiter; and its tail extended 40 deg. in length, which was visible for a considerable time after the nucleus was below the horizon. The most remarkable comet on record is that known by the name of Halley's comet, which appeared in 1680, and was visible for four months. It ascended almost perpendicularly, and its tail is said to have extended over a space of about 70 deg., and passed the sun at the perihelion, at the distance only of one hundred and forty-seven thousand miles. This comet was calculated to travel at the rate of eight hundred and eighty thousand miles an hour in its orbit; but, at its perihelion point, it is said to have been carried half round the sun's disc, at the astounding rate of one million two hundred and forty thousand four hundred and eight miles an hour! Hence, according to our notions of heat, on approaching the sun, this comet must have been exposed to a heat sufficient to have converted the most solid of terrestrial substances into vapor; and the sun's disc must have appeared to the astonished inhabitants, if any, to have extended from the horizon to the zenith, or about forty thousand times larger than it appears to us. Dr. Halley calculated the aphelion point of the orbit of this comet to be no less than eleven thousand two hundred millions of miles, a distance which seems almost incomprehensible, when compared with tangible numbers. The sun then at its aphelion could not appear at the comet above half the size that Mars does to us. The period of this comet is estimated at 575 years. Now, as Herschel appears to sweep the very verge of our solar system as at present known, it is very evident that the comet travels into infinite space, and visits other systems than that of which the earth forms a part.

(To be concluded in our next.)

THE THEATRES.

"See that the players be well used."—*Hamlet.*
"Nothing extenuate, nor aught set down in malice."—*Othello.*

Her Majesty's Theatre.—Mercadante's celebrated opera, *Il Giuramento*, was again repeated on Tuesday evening, and was as ably sustained as heretofore; indeed many of the *arias* were more brilliantly sung than we ever remember to have heard them.

The ballet *Le Lac de Fees*, concluded the evening's entertainments, and Cerito again won "golden opinions" by her graceful and fawn-like movements. Cerito now reigns here supreme, her lovely rival, Taglioni, having departed for Paris to fulfil a short engagement. Laporte, we believe, has arranged with her to perform two nights more, after her return from Paris, and before she finally departs for St. Petersburgh.

Mozart's *chef d'œuvre*, *Il Don Giovanni*, was produced on Thursday evening by (if we may credit Laporte) "particular desire." Grisi and Persiani sustained their respective characters most ably and vigorously; and each, in her own particular sphere, shone forth a star of the first magnitude and brilliancy. The *Leporello* of Lablache was a gem; his humor and vivacity were positively infectious. Rubini and Tamburini are equally deserving of praise, and from the *eclat* with which the opera went off, we predict that it will again be repeated.

Deshay's popular ballet, entitled *Le Brigand de Terracini* followed; the principal part being performed by the lovely Cerito; nothing could exceed her graceful, poetical, and, at the same time, modest movements. The house presented a *coup d'œil* of aristocratic beauty and loveliness.

Prince's Theatre.—Bunn, the *ci-devant* manager of Drury Lane, announced last week as being the "last but one" of the performances of the German Opera Company; but knowing the schemes and manœuvres of this gentleman, we are not at all astonished to find this week a repetition of the same announcement. We should not be surprised if there will be "*one week more*, by particular desire," and afterwards, "another week, by *special command!*" Gluck's celebrated masterpiece, *Iphigenia in Tauris* was repeated on Monday at this house. The story, which is of classic origin, is well known to every school-boy who has rehearsed the pages of Lempriere, or scanned the lines of the amorous Ovid. All are acquainted with the history of *Iphigenia*. The music may be pronounced wonderful: simplicity and sublimity are its claims to notice, and the choruses, treating of the highest passion, fall upon the ear like the voice of inspiration. Madame Heinefetter sustained the character of *Iphigenia*, and gave a very perfect and chaste reading of the part. Her acting exhibited, throughout, the finest passion, at the same time developing the tenderest and most touching pathos. Even in her wildest and soul-harrowing passion, the grace and beauty with which her action was invested, was classically lovely.

The character of *Orestes* by Herr Wild, was sustained with great spirit and energy, though not always elegant. Herr Staudigl portrayed, with accurate correctness, the part of *Thoas*. We mentioned last week, his being a most efficient successor to Herr Pöeck, and the manner in which he sustained this character has confirmed our good opinion of him. His voice is one unbroken current of delicious and rich music, which flows smoothly on, but irresistibly carries the feelings of his audience with it. On Thursday, Mozart's celebrated opera of *Titus* was produced. Of this, we shall have something to say next week. Last evening, *Iphigenia* was again repeated to a full and fashionable house.

Drury Lane.—The *Concerts d'Eté* are now firmly established in public approbation, and the house nightly presents a very animated appearance. The word promenade is now a misnomer, for the pit is so densely crowded that there is hardly room to breathe, much less to walk about in it. The selections of music continue to evince the same correct taste; and the execution, now that the band so thoroughly understand each other, is admirable.

Haymarket.—We would gladly draw a veil over the doings at this theatre, in so far as Charles Kean's outrages on Shakspeare are concerned. If the play-bills are to be credited (we fear they are *not*), Kean's engagement is well-nigh terminated; and then we hope to see Macready reinstated in his proper place. This gentleman, in conjunction with Mr. Power, is quite capable of filling Mr. Webster's treasury.

English Opera.—Fortune seems to shine propitious on the exertions of the dramatic *corps* of this establishment, and we are glad to see well filled houses applauding the productions provided for their entertainment. In addition to the recent successful novelties, a new farce has been brought forward, entitled *My Uncle's Card*. The plot is not new, but it gives scope for some good situations. The fun hinges on one card being given in lieu of another:—

Mr. and *Mrs. Quixote Quiet* have a daughter, *Emily*, who is loved by *Horatio Hairbrain*, but the union of the youthful pair is objected to by *Quiet*, who, because he himself married at 30 years of age, and had led a life of uniform happiness with his partner, imbibes the notion that the same result will befal his daughter, if her union is also deferred to the same ripe period of existence. *Hairbrain* and *Emily* are, of course, of a different opinion, and do not enter into the paternal superstition, which *Hairbrain* determines to destroy upon the arrival of the wedding-day of the *Quiets*, by making it a day of misery instead of happiness. To aid his design, old *Quiet* drops his card-case, which his nephew picks up and restores, but not until he has taken out all his uncle's cards, and given them to one *Sam Squill*, his creature, whom he directs to kick up all sorts of disturbances with all sorts of people, and to give old *Quiet's* card to all who demand satisfaction. This injunction is liberally attended to by *Squill*, and the result is a dreadfully unquiet wedding-day to the *Quiets*, a perfect dissolution of the uncle's crotchet, and the eventual obtaining of his consent to the union of *Hairbrain* and *Emily*, instead of keeping them waiting for their thirtieth year!

The farce, the night we saw it, was too long, and the jokes "painful." The weight falls on T. Green and G. Wild. The one as *Hairbrain*, and the other as *Sam Squill*, exerted themselves manfully, and secured the success of the piece.

Astley's.—The attendance here, during the week, has been such, that, to obtain a seat without previously securing it, has been a matter of considerable difficulty. We dropped in on Wednesday, to see the *Tower of London* again; it is still all-attractive, and is so well performed, that it would seem almost invidious to particularise any of the actors,—nevertheless, we must select for separate praise Le Petit Duenow, and Miss Ellen Daly, who is deservedly reckoned the goddess of this establishment. The first is a very clever, and promising youth; indeed, in the character of *Xit*, the dwarf, he gave evidence of much genius,—and the latter, as *page* to the Duke of Northumberland, looked "cruelly handsome," and played with the happiest effect. If it were the fashion to have pages in modern establishments, we would speedily honor the fashion, provided the gentle Ellen would number herself in our train. We saw her again, as *Peggy*, a country-girl, in the afterpiece, and might extend our praise, but it were needless. The "Scenes in the Circle" are just now particularly attractive. It is really worth all the admission money to witness Sig. Hellier, in the character of the *Courier of St. Petersburgh*. His management of the four rapid steeds, and the various manœuvres he practises during his "mission," are so surprising, that any attempt at description would convey but a vague idea of them. While rendering this homage, we should add that the steeds themselves are entitled to equal praise. Their displays of instinct, and nice appreciation of their master's will, place them very high in our estimation. Of Mr. Carter and his wild beasts—we can only say, that the exhibition to us, though wonderful, was a painful one. After his conflict with the tiger, we plainly perceived that Mr. Carter's arm had been severely bitten, the blood exuding through the pores, and deeply staining his raiment. We prophecy that he will, one day, pay the forfeit of his temerity, and be found shorter in stature,—by a head.

VICTORIA.—The new management opened on Monday, with the opera of *La Somnambula; Youth, Love, and Folly;* and the *Minerali.* These pieces, all things considered, were got through very fairly. A Mrs. FRANKS essayed the part of *Arinette*, the little jockey. It was a very grotesque performance, of a truth; but it excited laughter, and so far so good. This lady's person is by no means suited to man's attire, and she should turn her attention another way. We were pleased to see Miss PETTIFER in the two last pieces; her reception must have been very gratifying to her feelings. She played with great spirit, and sang her two songs very sweetly. The house has been fairly attended.

THE LATE MR. WARDE, THE ACTOR.—Mr. James Warde, whose real name was Prescott, the son of an officer of high rank in the British army, thought fit, when he first took to the stage, to assume the name of Warde. He was born in 1792, and having received a liberal education, his father obtained for him a commission, the half-pay of which he continued to enjoy, at all events, until the year 1825, about which date, we believe, he sold it. He never reached a higher rank than that of lieutenant of artillery. He evinced a youthful theatrical propensity, and early in life went upon the stage in the provinces, but he did not appear in London until his 26th year, when he played Leon, in "Rule a Wife, and have a Wife," at the Haymarket. He afterwards became a considerable favorite with the town, and although never entitled, from his talent, permanently to represent the very highest characters of the drama, for one season he filled the place of principal tragedian at Covent Garden. He was always more than respectable, and his Macbeth had many ardent admirers, and was thought by some judges to be the best since John Kemble and Young. It is to be observed, however, that subsequent to the day of John Kemble and Young, we have not had an actor completely capable of sustaining that great, perhaps greatest part. Edmund Kean did it well only in portions; Charles Kemble spoiled and equalised it to mediocrity, by attempting to render it too entire; and Macready (with all deference be it spoken) cannot prevail upon London audiences to adopt his notion and personification of the character. Of Charles Kean we say nothing now, because he is, as it were, upon trial in the stupendous task. Warde was good, by not endeavoring to do too much, and by refraining from exaggerating errors, where he knew he could not accomplish excellencies. He expired on Thursday, the 9th inst., after a long illness; and as his life, since he came on the boards, was one of struggle against pecuniary difficulties, partly occasioned by want of ordinary prudence, we fear that his circumstances, at the time of his decease, were far from easy. At one period, he obtained a weekly salary of £17, and while engaged in the metropolis, we believe he was never paid less than eight guineas per week.—*Observer.*

RAPID MOVEMENTS.—(From the *Gazette Musicale.*)—Mademoiselle Taglioni is coming to the opera. Immediately after her last appearance in London, she set out for Paris. On the 17th of this month she will perform the *Sylphide*, in the Rue Lepelletier, and will repeat the same part in *Le Dieu et la Bayadere*, and on the 25th she will have her benefit. On the 4th of next month, she must be in Mecklenburg, under a penalty of 25,000 francs; and, lastly, her return to the capital of Russia is peremptorily fixed for the 20th of the same month of August, under a penalty of 100,000 francs.

ALLEGED INFRINGEMENT OF A PATENT.

VICE-CHANCELLOR'S COURT—THURSDAY.

GIBSON AND ANOTHER *v.* HARVEY AND OTHERS.

This was an application to dissolve an *ex parte* injunction which had been obtained by the plaintiffs in June last, restraining the defendants, Messrs. Harvey and Co., and also a Mr. Wauklin, from infringing a patent which the plaintiffs had taken out in 1836, for a new and improved process or manufacture of silk, and silk in combination with other fibrous substances. The nature of the plaintiffs' patent invention, it would appear from the specification, consist—first, in a process by which the gum is discharged from a peculiar kind of silk called silk waste, when the same is in a state of sliver, or rove; secondly, a process by which the silk is dyed whilst in a state of sliver, or rove; thirdly, for spinning yarn from dressed or heckled silk waste of long silk fibres, either in the gum or discharged; fourthly, a process by which yarn from silk waste with long fibres, may be spun with flax of a similar length of fibre; fifthly, a process by which yarn from silk waste, with long fibres, is spun in combination with wool; sixthly, in the application of an improving process to the throstle-machine, on the principle of the long ratch, for the new and useful purpose of spinning silk waste; seventhly, for certain improvements effected in the throstle-machine, by which its utility in spinning silk waste is greatly augmented; and, eighthly, in the application of water to silk waste in long fibres, with the process of spinning with the long ratch. The plaintiffs, Messrs. Gibson and Campbell, are extensive silk manufacturers residing and carrying on business in Glasgow. The defendants, Messrs. Harvey and Co., are also manufacturers of silk, carrying on business both at Glasgow and in London, and Mr. Wauklin is also a silk-manufacturer at Manchester, having a large silk manufactory at Ashton-under-Line. The plaintiffs having, as they alleged, recently discovered that the defendants were manufacturing silk by means of machinery exactly similar to their own process, instituted two suits in this court against the defendants, to prevent any further violation by them of their patent rights, and they obtained the injunction which it was the object of the present motion to set aside.

Messrs. JACOB and MILNE appeared in support of the motion to dissolve the injunction. They submitted that the injunction could not be maintained for a moment longer, the affidavits filed by the defendants showing—although the defendants therein admitted that in what they were doing, they were doing the same as the plaintiffs; that the patent could not be upheld, as there was no novelty in the process used by the plaintiffs; that they (defendants) had long since informed the plaintiffs that they (defendants) were manufacturing silk waste by the same process; that that process had been used for years before the date of the patent; and that they had defied the plaintiffs to prove the originality and novelty of their process.

Mr. K. BRUCE (with whom was Mr. CAMPBELL) stated to the court, this morning, that he appeared for the plaintiffs, but would not take up the time of the court in resisting, at present, the motion, as he was of opinion that upon the affidavits now filed by the defendants in support of their case, the injunction could not at present be continued. A letter had just been received from his client, from which it would appear, that the case now made by the defendants could be hereafter met with affidavits. The injunction, for the present, however, must go.

The injunction, under these circumstances, was ordered to be dissolved.

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Applications for shares must be made, addressed to the secretary as above, prior to the 1st of August next.

Mining Journal Office, 37, New Broad-street, City, 27th June, 1840.

NEW WORK ON THE IRON TRADE.—The Number of the MINING REVIEW this day published, contains the Sixth Part of the Paper on the IRON TRADE, by Harry Scrivenor, Esq.—this work will be completed in Twelve Monthly Parts, and so arranged as to form a separate volume at the end of the year; in addition to which the MINING REVIEW contains—A Paper on the Establishment of a School of Mines—On the Ventilation of Mines, by Samuel Moyle, Esq., C.E.—On the Preparation of China-Clay, by W. J. Henwood, Esq., F.R.S., &c.—On Blasting Limestone Rock, being an Account of Blasting the White Limestone in the Country of Antrim, Ireland, by William Bald, F.R.S.E., M.R.I.A.—On the Applicability of Peat to Manufacturing Iron—Parliamentary Returns of the Imports and Exports of Copper, Lead, and Tin, for the year ending 5th January, 1840—Scientific Bodies, &c.—The MINING REVIEW is published at the office, as above, on the 1st of each month, price Sixpence.

The MINING REVIEW is also furnished, to subscribers, as a Monthly

GRATUITOUS SUPPLEMENT TO

THE MINING JOURNAL,

RAILWAY AND COMMERCIAL GAZETTE,

Forming a complete Record of the Proceedings of all Public Companies.

The "MINING JOURNAL" is the only newspaper exclusively devoted to Geology, Mineralogy, and Metallurgy; combining therewith reports of the proceedings of all public companies, correspondence from the English and Foreign mining districts, sales and purchases of ores, prices of metals and materials, prices of English and Foreign funds, shares in mines, railways, joint-stock banks, canals, &c., with parliamentary summary, London Gazette, and much original and interesting scientific intelligence, &c.; forming an invaluable record of every occurrence relating to mines, railways, joint-stock banks, &c.

The "MINING JOURNAL" is published at two o'clock every Saturday afternoon, at the office, 37, New Broad-street, City, to which address all Advertisements and Communications are requested to be addressed. Price 6d., and may be had of all booksellers and newsvendors in town and country.

RAILWAY MAGAZINE, AND COMMERCIAL JOURNAL. Railways, Banks, Mines, Steam Navigations, Assurances, Public Works, &c.—This long-established and extensively-circulated Work, which has attained the greatest celebrity for the value of its Articles, and its uniform success in all causes it has advocated, is now published WEEKLY, price 4½d. stamped, and consisting of 16 closely and handsomely printed pages. It contains full and accurate Reports of all Railway and other Joint-stock Company Meetings; Steam Navigation; Asphalte; Accounts of New Companies, Banks, Mines, Assurances, Canals, Docks; a most important table to all travellers of the times and fares of all Railway Trains throughout the kingdom; unique and valuable tables of the prices of Railway and other Shares, Paper Money in circulation, Metals, Traffic of Railways, Meetings, Calls and Dividends, General, Mechanical, and Scientific Intelligence. A Tide Table for every day in the Week for each Port frequented by Steam Vessels.

Orders received by all News Agents, and at the Office, 3, Red-Lion-court, Fleet-street, London; Messrs. Arnold, Liverpool; Mansell, Birmingham, &c.

PATENT ROLLING and COMPRESSING IRON COMPANY, 78, King William-street, city. Capital £125,000, in 5 000 shares of £25 each. Deposit £5 per share.

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The patent railway pins have for some time past been used on the railroads throughout England, and their superiority is established not merely by the certificates of some of the first engineers, but practically by the repeated orders of contractors and American agents, (some executed and others in course of execution,) the whole of which may be seen on application to the Secretary, who will show specimens of the article produced, and afford any further information relative to the undertaking generally.

Application for shares to be made to the Secretary, at the Company's offices.

TO IRONMONGERS, LAMP-MAKERS, and CAPITALISTS.—The inventor of a valuable Improvement in LAMPS, wishes to meet with a person who will advance the sum of money necessary to secure a PATENT for his INVENTION, on the principle of a division of the profits and advantages it may realise.

Persons wishing to treat, are requested to apply to Messrs. Delianson Clark and Co., at their Patent Agency Office for all Countries, 39, Chancery Lane, first door in Cursitor Street, London.

COLLEGE for CIVIL ENGINEERS, LONDON.

This Institution is now in operation.—Prospectuses and every information may be obtained on application to the Secretary at the office, 9, Villiers-street.

By order of the Council,

July 2, 1840. J. E. B. CURTIS,

Office, 9, Villiers-street, Strand. Secretary.

THE SHIPPING AND MERCANTILE GAZETTE, London Evening Journal of Maritime, Commercial, and Political News,—combining all the essentials of a Daily Newspaper, with the prominent features of complete and exclusive intelligence on every subject connected with the Shipping and Trade of the United Kingdom. The Shipping Gazette has obtained a character for correctness and usefulness unprecedented in the annals of Newspapers. It now commands an extensive circulation throughout the United Kingdom and the Colonies, on the Continent of Europe, in the United States of America, and other foreign countries; and is therefore a most eligible medium for commercial and miscellaneous advertisements, particularly those that relate to the sale, charter, freight, equipment, and sailing of vessels, and the sale of merchandise, and that have for their object the particular attention of Merchants, Ship-Owners, and Mariners, and those having dealings with them. The establishment of the Shipping Gazette forms a new era in the history of Shipping Intelligence; comprising, as it does, daily and complete announcements of the arrival and sailing of all vessels, in the coasting and foreign trades, together with an accurate account of vessels spoken at sea; state of winds and weather; accidents; losses; rates of foreign and coasting freights; premiums of insurance; wholesale prices of goods; stock-exchange news; coal, corn, and other markets; which information is regularly furnished and derived from the most authentic sources at home and in foreign countries trading with Great Britain. The Shipping Gazette further embraces a comprehensive detail of domestic and miscellaneous intelligence; records of all important events; reports of parliamentary proceedings, public meetings, decisions of law and police courts, &c., especially such as refer to nautical and commercial matters; and altogether contains a larger mass of information than is afforded by any other Evening Newspaper. The Shipping Gazette is frequently referred to by witnesses examined before Committees of the House of Commons, as furnishing the most authentic evidence on maritime affairs. Orders, communications, and advertisements for the Shipping and Mercantile Gazette, are received by its Agents at the respective out-ports, and by any News Agent in town or country. Advertisements and communications to the Editor, may be sent to the Publication Office, No. 54, Gracechurch Street, London.

HOLMES'S IMPROVEMENTS IN THE CONSTRUCTION OF IRON SHIPS, BOATS, AND OTHER VESSELS, also in Means for Preventing the same from Foundering, also in the Application of the same Improvements in parts thereof to other vessels.

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JONES'S PROMETHEANS.—The advantages the Prometheans possess over all other instantaneous lights, are their extreme simplicity and durability, as neither time nor climate can impair their original quality. They are composed of a small glass bulb hermetically sealed, containing about a quarter of a drop of Sulphuric Acid, encompassed by a composition of the Chlorate of Potash, enclosed in Wax Papers or Wax Tapers; the latter will burn sufficiently long for sealing two or three letters. The PROMETHEANS being pleasant to use, and never failing in their purpose, are rendered nearly as cheap as the common Lucifers. To be had of all respectable Chemists, &c., or at the Manufactory, 201, Strand.

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CAPITAL, £30,000.—In 3,000 SHARES of £10 EACH.

DEPOSIT £2 a SHARE.

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The great success which has attended the introduction of Wood Pavement, its superior cleanliness, freedom from noise, and saving in the wear of carriages, has induced talented persons to direct their attention to the best mode of its execution.

This company has been formed, with a view of working in the metropolis and its environs, a patent obtained for a principle, whereby the blocks fasten each other by equal angular pressure and form a dove-tail each way.

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N.B. A Solicitor is in attendance, daily, from Eleven till Two o'Clock, who may be consulted on all points of PATENT LAW.

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THE

INVENTORS' ADVOCATE,

AND JOURNAL OF INDUSTRY;

A WEEKLY BRITISH AND FOREIGN MISCELLANY OF

INVENTIONS, TRADE, MANUFACTURES, LITERATURE, AND THE ARTS.

PRINTED BY JOHN EAMES, 7, TAVISTOCK STREET, COVENT GARDEN.

No. 52.] SATURDAY, JULY 25, 1840. [PRICE FIVEPENCE STAMPED. CIRCULATING FREE BY POST.

COMMERCIAL SYSTEM OF BELGIUM.

A commission was appointed by the Belgian Chamber of Representatives at an early period of the last session, for the purpose of inquiring into the causes of depression in the trade and manufactures of the country. The investigation was prosecuted with diligence, but the session came to a close without any positive results having been obtained. The commissioners have addressed a circular to the different chambers of commerce, with a view to gain information for renewing the inquiry, and a schedule was annexed to the circulars, containing the opinions of those members of the commission who entertain the most liberal views of commercial policy. These members are said to constitute a minority of the commission, and their opinions have been combated with great zeal by the *Emancipation*, a Brussels paper, which, though professing to advocate the principles of free trade, conceives that the extent to which those principles are professed in this schedule, are calculated to destroy even the little commercial marine that Belgium still possesses.

"One thing, worthy of remark," observes this journal, "is the singular course taken, even to this day, by those who extol the system of *laissez aller*, so ruinous to our shipping, which is left without employ, and to our manufactures, which have no places of export. As this party was well aware that present experience told against them, and contradicted their predictions, they constantly pointed to the future as being about to realise the anticipated advantages of the system. From the first days of our existence as a nation, the leaders of this party maintained that every thing ought to continue on the former footing. It must be remarked, however, that this former system was no other than the legislation of 1822, which, acting on the principle of exclusively favoring our own colonies, sacrificed all our relations with other colonial markets. Afterwards, notwithstanding the advice, so curious and so *piquant* at the same time, of continuing a colonial system in a country without colonies, they did not hesitate to add, that we ought to confine ourselves to trade of the second order, that is to say, neither to sell nor to buy, excepting through the medium of neighboring states.

At the commencement of our trade, we were soothed with the charming idea that the public exhibition of our manufactures would create a demand for them throughout the whole world. When that hope proved fallacious, it was said that the sending of Belgian agents to distant markets would open the way for our manufacturers in those countries, and that this advantage could be obtained by the mere exhibition of samples of those articles that the inhabitants consumed. When the necessity of proposing new means of creating foreign trade afterwards became apparent, they exclaimed that it was desirable to defer the adoption of a system adapted to the interests of the country, until the recognition of Belgium allowed the adoption of such measures, and the passing of such laws, as were suited to her wants and her desires. In conclusion, we were assured that the completion of the line of railway towards the Meuse and the Rhine, with the adoption of an enlarged system of warehousing, and increased facilities of communication, would convert Antwerp into a European bazaar, and secure us the transit of goods towards Germany, Switzerland, and a part of France. At present, when all these splendid anticipations have been falsified, or are on the point of being so, when the depression remains, and the manufacturing crisis astonishes us by its continuance, as much as it before astonished us by its magnitude, what can these advocates of the *laisser aller* system still say? They have recourse to statistics, founded on the same principle, which persists in endeavoring to make us believe that the purchase of colonial goods, after they have been exchanged for the products of another European country, is as advantageous to Belgium as if we exchanged them directly for articles of our own produce, conveyed by our own mercantile shipping.

"The largest portion of our national marine continues banished to Holland, after having for many years expected what we believed was always on the point of being granted to it, a reasonable protection based on a system of reciprocal freedom. A small portion of the Belgian shipping, after having in vain tried every market in the world, has been obliged to limit itself to the importation of salt, and that of raw sugars from the Spanish colonies. These articles—thanks to the differential duty which exists in favor of the national flag upon the import of sugar, and to the prohibition of the importation of salt in foreign ships, which still continues in force—have been the only ones by means of which Belgian manufactures have been enabled to find sources of export beyond the sea. This may be considered a sufficient answer to the question—whether the protection given to the national marine be or be not too great?—which is the first question in the schedule of the commission of inquiry."

The writer in the *Emancipation* proceeds in the same spirit, to comment on the other propositions contained in the schedule, but we have already extracted sufficient to show the line of argument he adopts, and we shall therefore proceed to give some quotations from the schedule itself, which is important, as it exhibits the sentiments of an influential portion of the Chamber of Representatives, and announces the course of policy which those members of the commission of inquiry into the state of Belgian trade and manufactures who agreed to the schedule, would recommend to be pursued.

"We must not fail to bear in mind that Belgium is essentially a manufacturing and agricultural country, and that, consequently, its prosperity depends, in a measure, on the cheapness of its communications and means of transport. She should, therefore, especially avoid creating a dangerous monopoly of the latter. This monopoly would, however, be established whenever, by a protection to Belgian shipping, we should deprive ourselves of the useful competition of foreigners, for in that case the national marine, being free from all restraint, might arbitrarily fix the price of freight, and make manufactures and agriculture bend under the imperious law of its sovereign will. The manufacturer and the agriculturist would then be obliged to pay dearer for the materials which they require from abroad, and for the transport of the goods they wanted to export. By means of this double charge, it would be impossible for them to contend in foreign markets with other producers; whereas it is essential, that in foreign markets particularly, Belgium should be able to offer the surplus of her produce at a cheap rate."

The report then proceeds to consider the different commercial policy necessary to be pursued by a country that possesses colonies, and one that does not:—

"The states possessing colonies protect the direct trade with their foreign possessions, but independently of the colonial system, which Belgium need not consider, because she has no distant possessions, all nations, excepting France and England, pursue the same course that we do. Their tariffs are uniform; that is to say, they do not exact differential duties according to the places of import, but, as in Belgium, they give their mercantile marine a reduction, taken *in globo*, upon the custom dutics, to the extent indicated by the commercial laws of their respective countries.

"France alone has stipulated in her tariffs the

protection sho grants to every community, according to the places of import or export, and according as it is imported in a national or a foreign ship; but is the commercial marine of France in so flourishing a condition, as to make the system on which it is founded an object of imitation? Have her manufactures and agriculture reason to approvo of it? Tho constant remonstrauces of the ship-owners and the manufacturers against the existing maritime system, seem to give a negative to these questions, for whilst the first ask for still further privileges, the latter complain of the extent of those already existing. Similar complaints to the latter are beginning to be made in Belgium. Suppose, in fact, that by a system of differential duties, which is by some so much extolled, we should be led to adopt a tariff similar to that of France. In that case, to mention an example, the cotton imported from India would pay a duty of only 10 francs per 100 kilogrammes; that from European ports 30 francs; and if imported in foreign ships, 35 francs. Now, as it often happens that cotton is sold at a cheaper rate in the great markets of Liverpool and Havre than at tho places where it is produced, the effect of such a system would be to prevent our manufacturers from taking advantage of the favorable opportunities which these or other markets might present for making purchases. This objection, in the instance of cotton, is equally applicable to all the raw materials of manufacture, which the Belgian manufacturers now procure wherever they are to be purchased on the best terms. Should this state of things be altered? The question ought to be seriously considered before it is answered in the affirmative."

With regard to the internal navigation of the country, viz., that of the Scheldt and the Meuse, the report makes the following observations :—

"*Arrangements with Holland.*—Though it will not be a proper time to negotiate a treaty of commerce with Holland until tho questions still in dispute, respecting the free admittance of our ships on the exterior waters of those rivers shall be definitively settled, it may nevertheless be adviseable, considering the friendly intercourse that ought to subsist between the two countries, to take some steps to induce Holland to withdraw those measures which now present a decided appearance of hostility to our commerce. For instance, the coals imported into Holland by Belgian boats are subjected to the prohibitory duties of two florins per 100 kilogrammes, while not only the Dutch ships, but those of England and of Prussia, are permitted to introduce this article duty free."

COMPARATIVE DANGER OF HIGH AND LOW PRESSURE STEAM ENGINES.

A steam boat that was built by order of the Belgian government, to ply on the Scheldt, and furnished with high pressure engines, has been for some time past lying idle in the basin at Antwerp, in consequence of a representation having been made to the senate, that the use of such a steam boat would be dangerous. This circumstance has given rise to a discussion of the comparative danger of high and low pressure engines, and the Brussels paper, tho *Fanal*, remonstrates with the government for permitting what it terms a ridiculous prejudice to prevent the use of a steam boat built upon principles of superior safety. The *Fanal* observes, that it has been demonstrated by M. Arago, that high pressure engines are much less dangerous than low pressure ones; and the writer rather inappropriately refers to the practice in America, as a proof of the safety of such engines.

The boilers of low pressure engines in France are, by royal ordinance to that effect, obliged to be proved to five atmospheres, or to 75 lbs. to the square inch; and a high pressure boiler must be able to resist from 20 to 25 atmospheres; according as it is intended to be worked to five or six atmospheres of pressure. Now there is no low pressure engine, remarks the *Fanal*, "in which the steam may not be rapidly raised to a pressure of five or six atmospheres without intending it; whilst, in the experiments of Gay Lussac, M. Arago, and De Darcet, the pressure of steam could not be carried higher than 24 atmospheres. In addition to this, the tubular boilers of the Antwerp steam boat being protected from the principal cause of the explosions which arise from the boilers getting red-hot, it would be almost impossible to burst them even were the attempt to be made. This is the principal advantage of locomotive boilers; they never burst, and though sometimes a tube may split, such an accident is never attended with fatal consequences to the passengers. High pressure engines are much more simple in their construction, and are more certain in their operation, than engines of low pressure, which require a great deal of additional machinery, and are consequently much more likely to get out of order.

PRODUCE OF THE FRENCH MINES.

The produce of the mines of France is classed into two distinct divisions, that of combustible minerals and turf, and that of iron metallic ores, &c. This division has been adhered to in the following statement, commencing with the produce of the combustible minerals.

In order to form an idea of the actual state of the produce of combustible minerals in France, it is necessary to take a review of its progress for some years past. We therefore subjoin the following table, which gives an accurate representation of the produce of the coal mines, in millions of metrical quintals, at different periods since 1787 :—

Years.	Produce of France.	Imported.	Consumption.
1787	2	2	4
1802	8	1	9
1815	9	3	12
1820	11	3	14
1825	15	5	20
1830	19	6	25
1834	25	7	32
1835	25	8	33
1836	28	10	38
1837	30	11	41
1838	31	12	43

The following statement exhibits the relative importance of the different coal formations in France; the produce being that of 1838, given in metrical quintals.

Coals.—Loire, 12 millions; Valenciennes, 8 millions; Creuzot and Blanzy, 2 millions; Alais, 1 million and one-tenth; Aubin, 1 million; Epinac, 700,000; Littry, 500,000; Brassac, 470,000; Decise, 348,000; Basse-Loire, 324,000; Commentry, 264,000; Carmeaux, 254,000; Fins, 235,000; St. Gervais, 181,000; St. Foy-l'Argentière, 122,000.

Lignite.—Aix, 462,000; Bouxviller, 128,000; Bagnols, 105,400; Latour-du-Pin, 88,000; Orange, 65,000; la Cannette, 44,000.

Anthracite.—Le Maine, 408,000; le Drac, 229,000; Briançon, 27,000.

The Turf, extracted from 2,499 different places, amounts to four millions of metrical quintals.

The coals imported principally come from the following countries, and the quantities mentioned are those imported in 1838.

	met. quin.
Coal from Belgium	8,000,000
" " Great Britain	3,000,000
" " Saarbruck	1,000,000
	12,000,000

The exportation of coals from France, has been hitherto of little amount. From the coal bason of Valenciennes, in 1838, there was exported 211,000 quintals, and from that of tho Loire, 119,000.

The following table contains a statement of the quantities of coal produced, and the prices for 1838.

	French Coal.	Foreign.	Total
The quantity produced	31 millions.	12 millions.	43
Value at the places of produce	30 mil. of fr.	14 mil. of fr.	44
Value at the places where consumed	61 millions.	37 millions.	98
Average prices of met. quintals.		Average.	
At the places where produced	0 · 99 c.	1 · 15 c.—1 · 03 c.	
At the places where consumed	1 · 97 c.	3 · 08 c.—2 · 29 c	

The working of the coals in France employed in 1838, 24,000 men; that of lignite, 1,000; of the anthracite, 1,000; and the extraction of turf, 37,000; making a total of 63,000 workmen engaged in producing mineral fuel.

It is to be remarked, that the disproportion in the prices of the coals at the places where they are worked, and where they are consumed, is, in reality, in a great many cases much greater than it appears from the foregoing statement, because it gives the average prices at all the places of consumption; and therefore comprises those parts of the country not far distant from the coal pits, and consequently the prices there being much lower than the average price given, the cost at places remote from the coal districts must be proportionably so much greater.

The followiug is a statement of the produce of the blast furnaces, and forges in general, in France, in 1838, given in metrical quintals.

	Iron, (crude or cast).	Forged Iron.	Value mil. of frs.
1833	2,360,998	1,522,651	96
1834	2,670,636	1,771,638	107
1835	2,947,997	2,095,387	118
1836	3,083,630	2,105,805	125
1837	3,316,680	2,246,130	127
1838	3,477,766	2,241,957	127

The total number of blast furnaces at work in 1837, was 467; of which number 409 were worked with wood, 23 with coke, and 35 with coals, coke and wood; whether mixed, or used at different times, is not stated. In 1838, the number of blast furnaces burning coals increased to 54, and those of wood decreased to 389, the total nuuber in blast being nearly the same in both years. The apparent check which the iron manufacture received in 1838, is attributed by the *Moniteur Industriel* entirely to the general depression in trade, which affected all manufacturing products, and not to any insufficiency or want of power in the forges to produce a larger quantity.

The quantity of metals produced, besides iron, including bituminous minerals and salts, amounted in 1838 to 12 millions. In this estimate is comprised 11 lead mines, 3 copper mines, 12 mines of antimony, 13 of manganese, 8 of bituminous minerals, 19 of alum and sulphate of iron, and 373 mines of common salt. The value of the prodnce of the salt mines in 1837, was 8,300,000 frs., and in 1838 it was 8,900,000 frs. The working of the quarries continued the same in 1838 as in 1837, viz.: 40,388,419 frs. The other mineral substances, including marble, lime, &c., did not apparently vary a single franc between the years 1837 and 1838, the amount in each year being 151,260,249frs. The value of all the mineral products of France, in

the three last years that are given in these accounts, was

In 1836.....380,345,498 francs.
1837.....364,371,534
1838.....365,402,136.

EXPIRED PATENTS.

PATENTS THAT HAVE EXPIRED DURING THE WEEK ENDING JULY 18, 1840.

ENGLAND.

BENJAMIN LOWE, of Birmingham, gilt-toy manufacturer, *improvements in useful and ornamental dressing pins*, July 14.

JOHN GUY and JACOB HARRISON, Workington, Cumberland, straw hat manufacturer, *an improved method of preparing straw and grass to be used in the manufacture of hats and bonnets*, July 14.

JOHN PALMER DE LA FONS, George-street, Hanover-square, dentist, and WILLIAM LITTLEWART, of St. Mary Axe, mathematical instrument maker, *for an improvement in securing or mooring ships and other floating bodies, and apparatus for performing the same*, July 14.

EDWARD BAYLIFFE, of Kendall, Westmoreland, worsted spinner, *for improvements in the machinery used for the operations of drawing, roving, and spinning of sheep and lambs' wool*, July 14.

JOHN LANE HIGGINS, 370, Oxford-street, *improvements in the construction of cat blocks and fish hooks, and in the application thereof*, July 14.

SPECIFICATIONS.

A LIST OF SPECIFICATIONS ENTERED AT THE ENROLLMENT OFFICE, UP TO THE WEEK ENDING JULY 18, 1840.

(*Continued from page* 35.)

ENGLAND.

HEZEKIAH MARSHALL, of the city of Canterbury, architect, *improvements in window-sashes and frames, and in the fastening of window-sashes*, July 14.—First improvement is the mode of constructing the lower rails of sashes and the surface of the sill. That part of the sash which shuts against the sill is hollowed out, and along the edge of the jamb of this sill is formed a grove; whereby the air or rain is deflected off by the upper surface of such groove.

Second improvement is the application of a groove to the under part of the lower rail of the upper sashes.

Third improvement is a fastening for window-sashes. A spring bolt, working in a socket, is forced by the handle of a wedge into the brass mortice fixed on the opposite sash, and as soon as the button or handle of the wedge is drawn on one side, the spring bolt end comes out of the brass mortice on the opposite window-sash. There are modifications of this improvement, but they all work on the same principle.

Lastly, there is an improvement for preventing the shaking of the window sashes. A spring with a nib end, is attached to the side of the window-sash, so that the nib end shall press against the convex projection of a brass plate which is attached to the frame of the window, and near to that part where the sashes meet.

The inventor claims the application of friction rollers to window-sashes, but there does not appear any explanation to the same.

ARTHUR ELDRED WALKER, Melton-street, Euston-square, engraver, *improvements in engraving by machinery*, July 18.—The inventor claims the mode of engraving by what he calls engraving plate type, combined with other suitable mechanism.

A small square flat piece of steel is formed, by means of a die, with a concave and convex surface; on the concave surface is engraved the flower or letter required. This type or engraved piece of steel is then hardened, by putting it in a crucible containing melted salt (common salt), and is allowed to remain there until it possess a red heat, which may be easily seen through the liquid salt; after which, it is removed and placed in cold water.

This hardened type or engraved piece of steel is now employed to form a surface in relief on a convex piece of steel, which is hardened in the like manner, and thus is formed the type for engraving. These types are put into a suitable frame, which is placed over the plate of copper to be engraved. Hence, whenever a flower, or other figure, is required, the slide of the frame will bring the type over the part; when a small hammer, worked by a moderate spring, strikes the wedge piece above the type, which immediately impresses the copper plate with the engraving. By this means any workmen may engrave, as the hammer is so arranged as not to strike too hard, and the dies are formed with convex surface, so as to prevent their edges from touching the copper plate.

NOTICE.

In accordance with the determination expressed in our 26th Number, of giving one month's clear notice to Inventors, before publishing their specifications, we hereby inform the following Patentees, that their specifications will be published in the "INVENTORS' ADVOCATE" of August 29. Each party will receive, in addition, a *private* communication to the same effect.

Gerard Ralston, Tokenhouse-yard, merchant, due Aug. 22.
Richard Cuerton, jun., Percy-street, brass-founder, due Aug. 22.
Thomas Kerr, of Forecrofts, Berwick, due Aug. 22.
William Cook, King-street, Regent-street, and Liquorpond-street, due Aug. 22.
John Anson, Huddersfield, engineer, due Feb. 22.
William Winsor, Rathbone-place, artists' colorman, due Feb. 22.
Job Cutler, Lady-poole-lane, Sparkbrook, Birmingham, and Thomas G. Hancock, of Highgate, Birmingham, mechanist, due Feb. 22.

BRITISH PATENTS.

AN ALPHABETICAL LIST OF BRITISH PATENTS, GRANTED FROM JAN. 1ST TO JUNE 30TH, 1829.

(*For the Year* 1830, *see No.* 50.)

Air compressed for propelling, June 1, Mann, W.
Artificial light, Feb. 12, Heard, E.
Bonnets,—see Hats, D. A.
Boots,—see Composition, &c., H. R.
Bread,—see Dough, P. M.
Buildings,—see Warehouses, P. H. R.
Buttons, March 11, Church, W.
Calico-printing,—see Metallic cylinders, C. B.
Carriages,—see Drags, P. R.
Carriages,—see Friction, W. R.
Cloths,—see Embroidering, B. H.
Cocks,—see Taps, R. J. M.
Composition to fabrics for making boots, shoes, &c., March 10, Hall, R.
Condensing apparatus for sugar-making, April 28, Davis, J.
Condensing the gasses from muriate of soda, April 28, Wright, J.
Culinary apparatus,—see Flue, F. J.
Detector,—see Machine, M. W.
Doors,—see Window-frames, S. A.
Dough, preparing or kneading, June 19, Poole, M.
Drag for retarding carriages, Jan. 31, Parker, R.
Dressing cloths, &c., March 2, Haden, G.
Dressing woollen-cloths, May 26, Daniell, J. C.
Dressing woollen-cloths, &c., Feb. 20, Walker, S.
Embroidering and ornamenting cloths, May 2, Bock, H.
Engine by fluid or gases, April 28, Pickering, P. and W.
Felt, May 23, Williams, T. R.
Fire-engines,—see Machinery, S. T.
Flour dress machine, June 4, Smith, J.
Flue to culinary apparatus, Jan. 27, Fraser, J.
Friction reduced in carriages, May 28, Winans, R.
Gilding or silvering woven fabrics, Feb. 5, Burgis, J.
Gauge for strength of spirits, and measuring quantity withdrawn, May 26, Arnold, T.
Handles of knives, and knobs of drawers, of horn, &c. Jan. 14, Deakin, J. and T.
Harness and saddlery, Jan. 7, Taft, W.
Hats and bonnets, Feb. 5, Daninos, A.
Heat conducted for washing, scouring, fulling, &c., Feb. 5, Rayner, J.
Heels and tips for boots and shoes, June 13, Porter, R.
Horn,—see Handles of knives, &c., D. I. and T.
Keys,—see Locks, G. A.
Liquids into steam, Jan. 31, Ericsson, J.
Locks and keys, June 1, Gottlieb, A.
Machine for detecting trespassers, March 28, Maddeley, W.
Machinery of pumps, fire-engines, and waterwheels, Jan. 14, Smith, T.
Machinery,—see Paddle-wheels, W. O. H.
Machinery,—see Propelling, P. W.
Making and cutting paper, &c., Jan. 14, Dickinson, J.
Masts of vessels, Feb. 5, Green, R.
Measuring,—see Gauge, A. T.
Metallic cylinders for calico printing, April 23, Cook, B.
Milling,—see Scouring, H. S.
Musical instruments, June 19, Munche, A.
Paddle-wheels, Jan. 7, Gritton, S.
Paddle-wheels, Jan. 7, Robertson, A.
Paddle-wheels, Jan. 14, Cochrane, W. E.
Paddle-wheels and machinery, Jan. 7, Williams, O. H.
Paper,—see Making and cutting, &c., D. J.
Parasols,—see Umbrellas, C. J. H.
Pintles for hanging rudders, April 14, Lihon, Captain J.
Printing machine, March 19, Wayte, J. W.
Propelling carriages,—see Railroad, D. M.
Propelling,—see Air, M. W.
Propelling,—see Steam-engines, P. J.
Propelling vessels, Jan. 7, Neale, F.
Propelling vessels, May 19, Dutton, J.
Propelling vessels and machinery, May 26, Poole, W.
Railroad, and carriages propelled, May 21, Dick, M.
Rudders,—see Pintles, L. Capt. J.
Saddlery,—see Harness, T. W.
Sails,—see Windmills, H. J. C.
Scouring, milling, fulling, washing cloths, March 10, Hirst, S.
Shutters,—see Window-frames, S. A.
Silvering,—see Gilding, B. J.
Smelting and making bar-iron, March 30, Lambert, J.
Soap-making, May 26, Sturtevant, C. T.
Soda, muriate of,—see Condensing, W. J.
Spinning cotton, &c., May 2, Lee, G. W.
Spinning cotton, &c., June 4, Brooks, C.
Steam-engine, Jan 14, Udny, J.
Steam-engines, and propelling, Feb. 3, Pumphrey, J.
Steam,—see Liquids, E. J.
Sugar-making,—see Condensing, D. J.
Taps, or cocks for liquids, Jan. 19, Ross, J. M.
Tips,—see Heels, P. R.
Top-masts machinery, April 11, Prior, W.
Umbrellas and parasols, Jan. 21, Caney, J. H.
Warehouses and buildings, April 28, Palmer, H. R.
Washing, &c.,—see Heat, R. J.
Washing,—see Scouring, H. S.

Water-wheels,—see Machinery, S. T.
Windmills and the sails, Jan. 14, Hewes, C.
Wind musical instruments, June 19, Wheatsone, C.
Window-frames, sashes, shutters, and doors, Feb. 7, Smith, A.
Woollen cloths,—see Dressing, D. J. C.
Woollen cloths,—see Dressing, H. G.
Woollen cloths,—see Dressing, W. S.
Woven fabrics,—see Gilding, B. J.

BRITISH PATENTEES.

AN ALPHABETICAL LIST OF INDIVIDUALS WHO HAVE TAKEN OUT PATENTS IN ENGLAND, FROM JAN. 1ST TO JUNE 30TH, 1829.

(*For the Year* 1830, *see No.* 50.)

Arnold, Thomas, Gauge for strength of spirits, and measuring quantity withdrawn, May 26.
Bock, Henry, Embroidering and ornamenting cloths, May 2.
Braithwaite, John,—see Ericsson, John.
Brooks, Charles, Spinning cotton, &c., June 4.
Burgis, John, gilding or silvering woven fabrics, Feb. 5.
Caney, John H., Umbrellas and parasols, Jan. 21.
Church, William, Buttons, March 11.
Cochrane, William E., Paddle-wheels, Jan. 14.
Cook, Benjamin, Metallic cylinders for calico printing, April 23.
Daniell, Joseph C., Dressing woollen cloths, May 26.
Daninos, Alexander, Hats and bonnets, Feb. 5.
Davis, John, Condensing apparatus for sugar-making, April 28.
Day, Francis,—see Munch, Auguste.
Deakin, James and Thomas, Handles of knives, and knobs of drawers, of horn, &c., Jan. 14.
Dick, Maxwell, Railroad, and carriages propelled, May 21.
Dickinson, John, Making and cutting paper, &c., Jan. 14.
Dutton, James, Propelling vessels, May 19.
Ericsson, John, Liquids into steam, Jan. 31.
Fraser, James, Flue to culinary apparatus, Jan. 27.
Gottlieb, Andrew, Locks and keys, June 1.
Green, Richard, Masts of vessels, Feb. 5.
Gritton, Septimus, Paddle-wheels, Jan. 7.
Haden, George, Dressing cloths, &c., March 2.
Hall, Richard, Composition to fabrics for making boots, shoes, &c., March 10.
Heard, Edward, Artificial light, Feb. 12.
Hewes, Chuck, Windmills and the sails, Jan. 14.
Hirst, Samuel, Scouring, milling, fulling, washing cloths, March 10.
Kitchen, William H.,—see Smith, Andrew.
Lambert, Josias, Smelting and making b[illegible]on, March 30.
Lee, George W., Spinning cotton, &c., May 2.
Lihon, Captain John, Pintles for hanging rudders, April 14.
Maddeley, William, machine for detecting trespassers, March 28.
Mann, William, Air compresed for propelling, June 1.
Munche, Auguste, Musical instruments, June 19.
Neale, Francis, Propelling vessels, Jan. 7.
Palmer, Henry R., Warehouses and buildings, April 28.
Parker, Robert, Drag for retarding carriages, Jan. 31.
Pickering, Peter and William, Engine by fluid or gases, April 28.
Poole, Moses, Dough, preparing or kneading, June 19.
Poole, William, Propelling vessels and machinery, May 26.
Porter, Robert, Heels and tips for boots and shoes, June 13.
Prior, William, Top-masts machinery, April 11.
Pumphrey, Julius, Steam-engines, and propelling, Feb. 3.
Rayner, Joseph, Heat conducted for washing, scouring, fulling, &c., Feb. 5.
Robertson, Archibald, Paddle-wheels, Jan. 7.
Ross, James M., Taps or cocks for liquids, Jan. 19.
Smith, Andrew, Window-frames, sashes, shutters, and doors, Feb. 7.
Smith, John, Flour dressing machine, June 4.
Smith, Thomas, Machinery of pumps, fire-engines, and water-wheels, Jan. 14.
Storey, William,—see Hirst, Samuel.
Sturtevant, Charles T., Soap-making, May 26.
Taft, William, Harness and saddlery, Jan. 7.
Udny, John, Steam-engine, Jan. 14.
Walker, Samuel, Dressing woollen cloths, &c., Feb. 20.
Wayte, James W., Printing machine, March 19.
Wheatstone, Charles, Wind musical instruments, June 19.
Williams, Orlando H., Paddle-wheels, and machinery, Jan. 7.
Williams, Thomas R., Felt, May 23.
Winans, Ross, Friction reduced in carriages, May 28.
Wright, James, Condensing the gases from muriate of soda, April 28.

FOREIGN CORRESPONDENCE.

FRANCE.

THE ACADEMY OF SCIENCES, PARIS.

The annual public sitting of the Academy of Sciences was held on Friday, and was, as usual, attended by a number of ladies. The subject selected by M. Becquerel, who was the first to open the business of the sitting, was the application of the physico-chemical sciences to natural philosophy, and to the arts and manufactures, in which lecture he took into consideration the important discoveries that, during the last half century, have thrown so much light upon the great phenomena of nature, and to which we are indebted for a new power, the extent of which will probably be without limit. In the course of his lecture, M. Becquerel stated that by an application of electrical forces, ingeniously combined, in the separation of the different substances of which the ores of silver and gold are composed, it was hoped that a great saving of expense would result by abolishing the use of mercury, and also by dispensing with fusion, and the long and expensive operations usually adopted, by which the working of the poorer mines is at present prevented, as the cost exceeds the produce.

After M. Becquerel's lecture, M. Flourens read an eulogium on Frederic Cuvier, which was very skilfully managed. The life, the works, and the character of Frederic Cuvier presented few materials for an academical eulogium; for not only is the name of Frederic Cuvier altogether thrown into shade by the brilliant fame of his brother, but there was no marked feature in his modest character to give *eclat* to an historical notice. M. Flourens had the tact to place Frederic Cuvier under the protection of his brother, as he placed himself during the whole of his life, being engrossed entirely with the glory of his brother, and the friendship which united them to one another. The whole life of this philosopher, as well as his character, are comprised in the epitaph which he himself dictated to his son when on his death-bed, "Here lies Frederic Cuvier, the brother of George Cuvier." These are the only words he desired to have inscribed on his tomb, and they are a correct picture of his existence, and the objects of his thoughts—the satellite of his illustrious brother, he never pretended to do more than to reflect the light that sparkled from his genius.

Nevertheless, this modest philosopher possessed great zeal for the prosecution of science, and was not deficient in penetration in the observation of nature. M. Flourens did not fail to point out these qualities of Frederic Cuvier, nor to notice the really curious results at which he arrived, by persevering researches, continued for thirty years, aided by a clear judgment and great acuteness. He particularly directed his attention to the study of the intelligence and the instinct of animals, and certainly no philosopher has ever pointed out so distinctly the limits of those two faculties. For the want of distinguishing clearly, and separating the facts belonging to one or the other of these faculties, the various philosophical systems have either raised animals above man in the scale of intellect, or have denied them the faculties which a just appreciation cannot fail to admit they possess. For the purpose of raising man more highly above animals, some philosophers have denied that the latter possess any kind of intelligence; and when, on the other hand, it has been attempted to place man and animals in the same class, or to consider him as only the first of animals, instances of animal sagacity have been magnified into proofs of intelligence, which, as Frederic Cuvier has shown, are only marks of instinct, remarkable, it is true, but still without forethought, and absolutely beyond the animal's control. For instance, the swallow returning every year to the places which it visited the year before, and building its nest with wonderful skill; the beaver building its dwelling with all the skill of an accomplished architect, &c., have been adduced as proofs of the superiority of the intellects of animals. M. Frederic Cuvier has given these facts their true value, by demonstrating indubitably that they are not the result of intelligence, that is to say, of a reasoning and reflecting mind, but of a blind instinct, which the animal is compelled to obey. The ourang-outang, on the contrary, the most sagacious among animals, exhibits real intelligence, that is to say, a reasoning power, a choice of action. When shut up in a room in the *Jardin des Plantes*, he learns, without being shown, how to open the lock of a door, and if the door be too high for him to reach, he takes a chair, on which he mounts to get at it, &c. The necessity of distinguishing these acts, and numerous similar ones, of which we find examples in the monkey, the dog, and other intelligent animals, from the blind instinct which directs the beaver to build its dwelling, or the bee its honeycomb, is apparent from the circumstance that young beavers placed in the *Jardin des Plantes*, in cabins perfectly sheltered, where they can want nothing, commence building their houses as if they were in their natural state exposed to the inclemencies of the weather. We find also, in the materials collected by Frederic Cuvier, a very interesting and correct observation on the faculty possessed by certain species of animals of assisting the labors, and accustoming themselves to the life of man, so as to become what are termed domestic animals. Buffon considered the domestication of animals as the direct effect of education, and he, therefore, confounded the faculty of being tamed with domestication. But domestication has its foundation in the nature of animals, and in their innate dispositions, to such a degree that it is easy to determine beforehand the kinds that are susceptible of domesticity, and those that are not; in short, those species which herd together are alone capable of becoming domesticated, whilst the solitary animals may indeed be tamed, but they never become domesticated, and the strongest proof of their savage nature is, that they never reproduce when in a state of slavery. M. Flourens spoke in a very touching manner of the strong affection subsisting between the two brothers. He greatly affected the audience in describing their deaths, which both took place at the same age, and in the same manner, by an affection of the spinal marrow, of rare occurrence, which permitted them to trace the progress of the disease, to announce the termination of it, and to meet their end with that calm resignation and courage, which did not leave them for a single instant, in the midst of the grief of their friends.

The following are the prizes awarded at this public sitting of the Academy. The prize for experimental physiology was awarded to M. Payen, for his work on starch; the prize relative to unhealthy

trades, to M. Vallat, for his safety bed applied in mines; and to M. Laeguel a reward of 1,500frs. for a plan for preventing accidents on the curves of railways. In the class of medicine and surgery, the following prizes and rewards were bestowed; a reward of 3,000frs. to M. Vincent Duval, for his work, entitled, "A Practical Treatise on Club-foot;" a reward of 3,000frs. to M. Fuster, for a manuscript memoir, entitled "The Diseases of France in reference to the seasons, or the Medical and the Meteorological history of France;" and a reward of 2,000frs. to M. Fourcault, for a manuscript memoir, entitled "Physiological experiments showing the influence of the mechanical suppression of the perspiration on the alteration of the blood and on the development of local injuries attributed to inflammation."

The prizes for mathematical science were awarded as follows:—The astronomical prize founded by Lalande was given to M. Galle, joint astronomer at the Berlin observatory, for the discovery he has made of three comets, on the 2d Dec., 1839, and on the 25th Jan. and the 6th March in the present year. The mechanical prize was awarded to M. Arnoux, for his plan of jointed wagons; and the statistical prize was bestowed on M. Dausse, engineer of roads and bridges, for his work on the Statistics of the principal rivers of France.

BELGIUM.

STATISTICS OF SUICIDES IN BELGIUM.

The following details respecting the suicides in Belgium during the four years, 1835 to 1838 inclusive, are taken from official documents recently published. The first table exhibits the number of suicides in each province in the separate years.

	1835	1836	1837	1838	TOTAL.
Antwerp	15	24	24	28	91
Brabant	53	44	35	22	154
West Flanders	25	21	26	33	105
East Flanders	30	31	20	28	109
Hainault	10	12	19	12	53
Liège	12	21	17	14	64
Limburgh	4	7	5	4	20
Luxemburgh	2	2	3	4	11
Namur	0	2	8	3	13
	150	164	157	148	620

It will be seen from the above, though there are some fluctuations in the number of suicides in each province, that there is, when taken together, a remarkable approximation in the general results, which tends to justify the profound reflection of M. Quetelet, that the balance of human weaknesses and errors is settled with frightful regularity.

The following is a comparison of the total number of suicides, with the population, in the respective provinces.

	Suicides	Average Population	Proportion of Inhabitants for each suicide (per year).
Antwerp	91	361,049	15,697
Brabant	154	594,928	15,656
West Flanders	105	629,372	24,206
East Flanders	109	761,057	28,187
Hainault	53	636,619	48,972
Liège	64	392,675	24,542
Limburgh	20	332,794	66,559
Luxemburgh	11	323,883	107,961
Namur	13	228,234	76,078
Total	620	4,260,633	Average 37,049

Of these 620 suicides, 465 were males, and 155 females; the proportion being exactly as three to one. Nearly half of the suicides (348) were, or had been married. The causes of suicide are classed as follows:—

	Males.	Females	Total.
From Misery	42	12	54
Disappointed ambition	4	1	5
Love	11	7	18
Madness	80	39	119
Shame	16	10	26
Drinking	20	6	26
Physical disease	21	7	28
Fanaticism	10	3	13
Jealousy	9	1	10
Domestic griefs	28	12	40
Unknown causes	224	57	281
	465	155	620

The means of destruction used are mentioned in 515 cases only; viz., by hanging, 225; by drowning, 142; by fire-arms, 84; by cutting instruments, 32; by falling from a height, 17; by the fumes of charcoal, 12; and by poison, 3.

FINANCIAL CONDITION OF THE PROVINCES AND TOWNS OF BELGIUM.

We extract from the last statistical papers published by the department of the Interior, the following statement of the revenues of the provinces, towns, and rural communes of Belgium, for 1837.

	Provinces.	Towns.	Rural Communes.
Antwerp	839,585	2,695,427	905,165
Brabant	565,376	4,609,069	957,789
West Flanders	784,339	1,699,096	1,210,841
East Flanders	500,216	3,684,644	1,247,504
Hainault	701,491	1,192,762	2,066,221
Liège	385,100	2,458,875	97,700
Limburgh	1,066,851	378,157	1,080,296
Luxemburgh	200,406	173,701	2,129,650
Namur	608,077	431,166	1,242,708
	5,651,445	17,322,897	11,803,184

If these amounts be added together, and the receipts and expenses of the state be included, it will be found that in the year 1837 there was levied from the whole population, or at least that there was expended, about 130 millions of francs, besides the allocations for the railroads; as under—

	Revenue.	Expenditure.
Budget of the State	94,972,286	96,688,766
Budget of the Provinces	5,651,445	5,651,445
Budget of the Towns	17,322,901	18,198,116
Budget of the Rural Communes	11,803,984	9,247,322
	129,750,619	129,785,651

The number of students entered at the University of Ghent at the commencement of 1840, was 306. The University of Brussels, which had not more than 282 students during the scholastic year 1838-39, has at present 354; being an increase in one year of 72.

The average prices of wheat and rye in the regulating markets of Arlon, Antwerp, Bruges, Brussels, Ghent, Hasselt, Liège, Louvain, Namur, and Mons, having arrived at the standard prescribed by the laws for the admission of foreign corn, wheat and rye are now admitted into the kingdom duty free; and their export, as well as that of potatoes, and the flour made from them, is prohibited. The average price of wheat is 23 f. 55 c., and of rye, 15 f. 81 c. per hectolitre, which contains twenty-two English imperial gallons.

The traffic on the Belgian railroads continues to increase, particularly in the conveyance of passengers. In May last, there was an increase of 40,000 passengers compared with the month of April comprising the new line opened from Brussels to Tubise; and in June last there was an increase of 36,000 passengers compared with the month of May. In the latter month, there were conveyed 198,178 passengers, and in June, 233,944, in which number there was included only 29 soldiers. The receipts increase in the same proportion. In May the total amount received, was 453,329f.; in June, 499,915f.; the increase in the receipts is almost exclusively on the conveyance of passengers, the quantity of merchandise being nearly the same in both months.

The Minister of the Interior has received from the French government the 36th and 38th volumes of the official collection of expired French patents. The volumes have been deposited in the Museum of National Industry, for the inspection of artists and manufacturers.

Increase of Brussels.—At the period the allies entered Brussels, there were only 11,200 houses in the city, the number at present is at least 15,000, so that there has been an increase of nearly 3,000 houses in the last twenty years. The population in 1819 was only 85,000, and it is now 106,000; and the number of marriages has increased since 1819, from 668 to 1,132. During 1839, there have been 350 new buildings erected in the faubourg of Brussels.

The Prince of Orange has sent a letter of condolence to Madame Cockerill, on the loss of her husband. Before her departure from Warsaw, the widow of that distinguished engineer had the consolation of receiving from the Viceroy of Poland expressions of the deep regret he felt at her loss, and the assurance of his continued protection.

M. Resing, jun., residing in Ardennes, intends going to Rio de Janeiro with an experimental cargo of Belgian and French manufactures, consisting of arms, jewellery, bronzes, dresses, &c. His object is, before proceeding on a larger scale of operations, to ascertain the advantages to be derived from the sale of these different articles.

The first stone of a manufactory for steam-engines, locomotives, &c., has been laid at Antwerp, to be built for Messrs. Dixon and Co.

M. Nothomb has sent two copies of his Report on the Belgian Railways to each member of the German Diet; one intended for the use of each government, and the other for the personal use of the members.

The price of wheat and rye continues to rise in Belgium. This fact excites some surprise, for the markets are well supplied; and, last week, 1,200 more hectolitres of wheat and 600 more of rye were sold in Brussels than in the preceding week.

A large ship freighted with cotton from America, arrived at Antwerp last week, and in a few days the whole cargo was sold to one purchaser.

M. Liedts has sent a circular to the Chamber of Commerce, in Belgium, in which he directs their attention to the fact that more than 126 millions of francs in value of foreign woollens, besides cloths and kerseymeres, were consumed in the country between 1832 and 1839; but that, during the last year, the quantity imported was considerably reduced. The cause of this reduction is supposed to be owing to the increased protecting duties on the Belgian manufactures by the law of 1838, which raised the duty from 10 to 12 per cent.

The Rubens Fetes.—The central commission of the Society of Science, Literature, and the Arts, has decided on the mode of expending the sums voted for the fêtes commemorative of Rubens at Antwerp. The following are the principal objects

of expenditure. In the first place, there is to be a distribution of money to indigent families; a certain sum is to be given to the society of *William Tell*, which will summon all the archers in the kingdom to contend for the prize; donations to the society of *St. Cecilia* for a third extraordinary fête, and to different dramatic and other companies; the expense of an illumination for two nights; boat races on the Scheldt: two public balls; fireworks; triumphal arches; monuments; and, what is not least important to the populace, a fountain will be erected in honor of Van Schoonbeek, inventor of the hydraulic machine, which is to flow with an uninterrmitting stream of strong beer.

SOUTH AUSTRALIA.

We have been favored with the following extract of a letter received by a mercantile house in this city, from a correspondent in Launceston, Van Diemen's Land, dated 8th February, 1840:—"South Australia is now beginning to feel the effect of the continual drain upon it, to provide the necessaries of life, but as they could not provide one single article themselves, they had to send elsewhere, and for which they had to pay hard cash; immense numbers of sheep and cattle have been sent there, both by sea and land; at first they paid those who were provident enough to lay by for a rainy day, and secure some stock, but where a whole community is feeding upon one another, a crisis must arrive; they are now sending stock from there to the Swan River; you may rely upon it (whatever those in London whose interest it is to make things appear well, may publish or attempt to gull the people with) the scheme is a failure; they find out, when it is too late, that the settlement is ill judged; by this plan also a large sum has been made by laud-jobbing, and those who have cleared any thing leave as soon as they can. They are now wanting flour, but all have to send the money for it or go without."—*Journal of Commerce.*

EAST INDIA STEAM NAVIGATION COMPANY.

The practicability of establishing a communication with India, by way of the Red Sea, having been fully established by the experiments made by the East India Company, this association has been formed to carry into effect, on an extensive scale, a plan whereby an uninterrupted intercourse may be secured between Calcutta, Madras, Ceylon, and England, reducing the communication to as great a degree of certainty as can be contemplated by any means of access at present within our reach. The advantages likely to arise from the active and efficient operations of the company, are so manifest to those immediately interested in our commercial relations with India, and especially to those located there, that we find the late mail brought over, not only assurances and promises of support, but also remittances—subject, however, to their application being in case the directors should determine on immediately establishing a line between Suez and Calcutta (a line wholly unoccupied at present). The directors, it appears from their prospectus, fully sensible of the benefits which may be calculated upon from a local subscription, have at once determined on acting on the suggestion, and have accordingly taken measures for the immediate purchase of the largest steam-vessel procurable, which will be sent out without loss of time.

To carry the entire service into effect, however, so as to insure a regular monthly communication, it is proposed to build seven steam-ships, of tonnage and power applicable to the route by the Cape of Good Hope, in case of any interruption through Egypt, thereby precluding the possibility of any impediment to carrying out the proposed measures of the Company. It is stated that the number of passengers actually passing between Calcutta, Madras, and Ceylon, and Europe, may be taken at 2,500 to 2,600; but this number may be calculated on being considerably increased, if we are to judge from the increase which has taken place by locomotives on land, or steam-navigation with America and the Continent, while the facility which will be afforded of conveyance from port to port in India will naturally tend to augment the income of the company. The outlay contemplated for building and fitting the seven steam-ships, with all incidental charges in the full establishment of the Company in active operation, is assumed at £600,000, and to cover which the nominal capital is fixed at £800,000. —*Mining Journal.*

RAILWAY INTELLIGENCE,

DOMESTIC AND FOREIGN.

London and Blackwall Railway.—No fewer than 67,154 persons were conveyed on the London and Blackwall Railway during the first eleven days from the opening, and this, although only one line of rail is yet open, and the accommodation at the stations is far from being so complete as it will very soon be. The number of passengers would have been much larger, had the company's arrangements admitted of more frequent trains. On Sunday, it is calculated that upwards of 20,000 persons presented themselves at the several stations, and out of that number, as appears from the returns, not more than 8,313 could be accommodated. The second line of rails will be opened, we understand, in the course of a fortnight, and then the despatch of trains will be much simplified and accelerated. Already several steam-boats are advertised as starting from the terminus at Blackwall. The mode adopted for working the railway has, we hear, given the fullest satisfaction to the directors and engineers of the company. In fact, they no longer look upon it as an experiment, and although various minor improvements will, of course, suggest themselves in practice, the soundness of the principle is considered as placed beyond question. It would be quite impossible to work the Blackwall line by locomotive power, for although less than four miles in length, there are already three stations intermediate between the termini. Another station will be opened in a few weeks, and a fifth in the course of the season.—*Railway Times.*

Greenwich Railway.—We understand that this Company having lowered the fares of their second class to 6d., it has already increased their receipts nearly ten pounds a day. The receipts of this Company for the last half year, including Croydon toll, have been £30.326 14s. 11d., and the number of passengers 786,999. With these facts before us, it is quite evident that with good management this line will realise all that was expected of it. Independent of other lines, it contains within itself the elements of success, and, unless we are much mistaken, will prove a good and profitable concern. —*Railway Magazine.*

The London and Brighton Railway.—The greatest activity prevails on the whole extent of this line, and the final completion of the work is now looked forward to. Eight hundred men are alone employed between Brighton and Clayton, and no exertion is spared by the contractors and those engaged in this important undertaking. The deep cutting to the south of Major Paine's, at Patcham, is nearly finished, and great progress is also made with the tunnel which is to pass under that gentleman's estate. Further up, that portion of the work in the contract of Mr. Flavel, is in a state of great forwardness, and the formidable cutting in this part will be completed in a short time. In fact, between this point and the Clayton tunnel, a few months will suffice to complete the whole works, and there is no apparent reason why within one year from this time, the public should not be travelling by steam to London. Higher up the line, some striking objects present themselves. Of these are the Pool Valley Viaduct, of eight arches (now nearly completed), and the Ouse Vale Viaduct, of 30 arches, in a state of forwardness. The works also in the neighborhood of these structures, are being carried on with energy, and in a great many parts the permanent rails are already laid.

Communication between London and Dublin.—It is the intention of the London and Birmingham Railway Company, in conjunction with the Grand Junction, the Crewe and Chester, and Chester and Birkenhead companies, as soon as the two latter lines are opened (which will take place either next month or in September), to accelerate the mail trains, so that they will reach Birkenhead in six hours and a half after their departure from London. This can be easily effected, as, in addition to shortening the distance from Birmingham to Liverpool about thirteen miles, by means of the line from Crewe to Birkenhead, the gradients are greatly superior to those on the Liverpool half of the Grand Junction Railway. It is in contemplation to fix the departure of the mail packets from the Birkenhead side of the Mersey, which will cause another saving of twenty minutes, as the railway runs close to the pier. The mail communication between the two capitals will, by this arrangement, in ordinary weather, be effected within nineteen hours, which is, in fact, only one hour and a quarter more than what was expected to be accomplished by the Chester and Holyhead line of railway, and steamers from the latter port to Kingston.—*Dublin Monitor.*

South-Eastern (London and Dover) Railway.—A special general meeting of the proprietors of this railway has just been held at the Company's offices, in Coleman street, for the purpose of confirming the forfeiture of some shares, the calls upon which had not been paid up. The chair was taken by T. W. Tyndale, Esq. The forfeiture of the shares in question having been unanimously confirmed, and power given to the Directors to dispose of them, a very interesting conversation took place, from which it appeared that, since the late general meeting, the whole of the line from Godstone to Redstone-hill, where it joins the Brighton line, has been put under contract, at prices varying from 12½ to 16 per cent. under the Parliamentary estimates, and that, exclusive of this portion of the line, there are 760 men employed on the works between Folkstone and Dover, and 580 in the Tunbridge district. It was stated that Mr. Stephenson, the eminent engineer, has recently become a large holder of shares in the Company, and that, having closely inspected the works, that gentleman's opinion of them is most favorable. There was, it was also stated, reason to believe that the projected railway from Paris to Lille and Calais would speedily be carried into effect, which would, of course, contribute greatly to the prosperity of the London and Dover line. A special vote of thanks having been unanimously passed to the Chairman and Board of Directors, the meeting separated, the proceedings having apparently given very general satisfaction.

Hull and Selby Railway.—A special meeting of the Directors of the Hull and Selby Railway was held at the Company's offices on Wednesday se'nnight, for the purpose of conferring with a deputation from the General Post-office in London, respecting the transmission of the mails, not only from London, but all parts of the country, south, west, and north, by railway to Hull. The conference lasted several hours. Its chief object was to arrange the arrival and departure of trains to meet those of the various other railways now in existence, and the business was so far proceeded with as to enable the deputation to report to the Postmaster-General. In the event of his sanctioning the arrangement proposed, three weeks' notice of their adoption will be given by him, from the date of his reply. The reply is expected to be received in the course of a few days, and the strongest probability exists that the new arrangement will take place in the beginning of August. So far as regards the London mails, we can state that no doubt now exists that the following plan will be adopted:—The mails will be despatched from London every evening at the usual hour, and arrive

at Hull at half-past eight o'clock the following morning; the delivery to take place at a quarter before nine, and the return bags for London to be made up at five o'clock in the afternoon, thus leaving the whole of the best part of the day for the transaction of business, our correspondence both inward and outward being transmitted during the hours of our social intercourse or repose. With respect to the morning mail from London, the hour at which it would arrive in Hull, if adopted, would be 10 at night, and the return mails having to be made up on the next morning, would afford no advantage to the town, and there is no intention at present to attempt it. The western mails will arrive and depart with those of the south. The north mails will be subject to another arrangement.—*Eastern Counties Herald.*

The Great Western Railway.—New Carriage for Her Majesty, &c.—On Monday, the line of the Great Western Railway was further opened from Steventon to the Faringdon-road, a distance of sixty-three miles from London. The company, anticipating the patronage of the Queen, have just had built a splendid railway carriage for her Majesty's accommodation. It is 21 feet in length, and is divided into three compartments, the two end ones being 4 feet 6 inches long and 9 feet wide, while the centre forms a noble saloon, 12 feet long, 9 feet wide, and 6 feet 6 inches high. At each end is a large window, affording a view of the whole of the line. The interior has been magnificently fitted up.

The Great Western Railway.—Scandalous Treatment of Passengers by the Company's Servants.—We have received a letter complaining of the guards or police at the Slough station on the Great Western Railway. On Sunday evening a fellow, buttoned up in a mackintosh, took the liberty of pushing about the passengers waiting for the train. The directors must know that such conduct cannot be tolerated, and no peace officer is justified in laying hands upon any individual until his authority has been resisted. No order of the directors can justify their *employés* in committing an assault. —*Times.*

Falling of Three Arches on the Great Western Railway.—On Friday morning, three of the recently constructed arches near the Bristol terminus of the Great Western Railway fell in. The foundation was first observed to give way on Monday last, and on Thursday night it had sunk very considerably. The arches nearly adjoined the bridge across the feeder.—*Bristol Mercury.*

Preston and Wyre Railway.—The Preston and Wyre railway was opened on Wednesday, and has commenced taking passengers and parcels to Kirkham, Fleetwood, &c.—*Liverpool Chronicle.*

Brighton and Shoreham Railway.—The number of passengers on the railway between Brighton and Shoreham, since the opening (about two months since), has exceeded 42,000 persons, and it is proposed to extend the line, very shortly, to Worthing.

North Midland Railway.—Is it correct that the North Midland Railway Company has raised the fare from Sheffield to Masbro', from 6d. to 1s.? If so, it is high time that the Sheffield and Rotherham Company provided decent second class carriages; those at present in use are most disgraceful.—*Sheffield Patriot.*

North Midland Railway.—We are sorry to find that some of the shareholders in this concern have felt disappointed at the smallness of the first week's traffic returns. If they expect £8,000 or £10,000 a week to flow in upon them at once, they must be very inexperienced in railway matters. Was it so in the London and Birmingham, Great Western, and South Western, or any other line now possessing large traffic? The lowness of the returns in the London and Birmingham, and South Western, at first, was notorious, and not enough to pay the expenses. If the judgment of men, the most experienced in railway matters, is worth anything, this line must eventually turn out one of the most valuable of the great trunk lines yet made.—*Sheffield Iris.*

The Northern and Eastern Railway will open to Broxborne in August; and we understand on the 1st of September several of the Cambridge coaches will go on the line, reducing the time an hour and a half in the journey to London.

Manchester and Bolton Railway.—The affairs of this Company are making way, although slowly. The works are proceeding satisfactorily.

Gloucester and Cheltenham Railway.—We have reason to believe that in little more than three months the public may anticipate that the line from this city to Cheltenham will be open for traffic, and that before the end of the year the whole line from Gloucester to Birmingham will be in full work. No very inconsiderable revolution has already taken place in the coaching departments of the neighborhood since the partial opening of the line from Cheltenham to Broomsgrove, most of the Birmingham coaches from this city, &c., having altered their route, so as to make use of the railway.—*Gloucester Journal.*

Southampton Railway.—The receipts of the Railroad from London to Southampton, for the week ending on the 19th instant, were £7,628. 14s. 10d.

Newhaven Railway.—Since the recommencement of operations on the Newhaven line of railway, considerable progress has been made. A great number of workmen are employed by the contractors in the various departments of the excavation, masonry, &c.; and, should no unforeseen obstacle present itself, before the end of the summer the portion of the railway above ground will be well on towards completion. The great undertaking of the tunnel, if it is to be carried forward, will then be commenced. This part of the plan is by far the most formidable; but it may be accomplished with more ease than is generally anticipated.

Accident on the Liverpool and Manchester Railway.—On Saturday evening, a serious collision took place on the Liverpool and Manchester Railway, near this town, between two trains belonging to the Grand Junction Company. It appears that the train which left Birmingham at five o'clock, having made a quick passage, had overtaken the second-class train, which left at half-past three, and followed it at a moderate and what was supposed a safe distance, towards the town; but on rounding the curve in the road, near Ordsall-lane, the engineer of the five o'clock train suddenly came in sight of the other. The engineer reverved the steam, and put on the whole force of his brake; but he found it impossible to stop the train before it came in violent contact with the second-class train. Nearly the whole of the passengers in both trains were thrown from their seats by the concussion, and a number of them severely, though, we are happy to say, none dangerously, hurt.—*Manchester Guardian.*

Accident on the Eastern Counties Railway. —On Sunday evening, as the five o'clock train was on its way from London, near Romford, the hat of a man named Henry Jay was blown off, and he, in spite of the earnest expostulation of his brother-in-law, J. Cooke, and when the engine was at twenty-five mile speed, jumped off to recover it. The train was stopped as quickly as possible, and the poor man was taken up senseless. On his arrival at the Brentwood station, surgical assistance was speedily procured, and, on examination, an extensive fracture of the skull was discovered. The operation of trepanning being found necessary, it was performed, but he is now lying at Great Warley, with not the smallest hopes of recovery. The accident was occasioned by the unfortunate man's own rashness.—*Essex Herald.*

Fire caused by a Railway Engine.—Friday afternoon, a quantity of straw in Mr. Wordsworth's farmyard, at Walton, was set on fire by some hot cinders which fell from the fire of one of the North Midland Railway engines being blown off the embankment into the farm-yard, which is situated near the line. The fire was discovered immediately, and proper assistance was obtained, and the fire was got under before any considerable damage was done. There were two valuable corn-stacks close by, which would in all probability have been destroyed, if assistance had not been immediately obtained.—*Doncaster Gazette.*

Maryport and Carlisle Railway.—On Wednesday last, a portion of the Maryport and Carlisle Railway, which when entirely completed will, by its junction with the Newcastle and Carlisle line, form a direct railway communication between the Irish Sea and the German Ocean, was formally opened. About seven miles of the railway is now finished, extending from Maryport to the coal-pits at Arckleby and Oughterside, and this part of it is opened.—*Carlisle Patriot.*

Edinburgh and Glasgow Railway.—We gather the following particulars respecting this important undertaking from the *Glasgow Constitutional* of Saturday week. The works on the line from Edinburgh to the Almond Valley, a distance of about eight miles, have recently been commenced, but they are neither of a difficult nor of an expensive character. The line will be carried across the valley by means of a viaduct of thirty-six arches, of fifty feet span, and varying from sixty to eighty-five feet high. Near this point it has been found, on levelling some of the embankments formed last year, that the subsidence was only three inches, although the earth had been raised so as to allow twenty-one inches to subside. This arises from the mixed character of the materials used (stones, blaze, &c.,) and will prove a great saving in the future maintenance of the line. Onwards to the west, the line passes through the Winchburgh Whinstone Ridge, and here is a tunnel of 360 yards, of which 250 yards are completed. This important work is proceeding rapidly. The Avon and the valley through which it runs, are crossed by a stone viaduct of twenty arches, some of them upwards of ninety feet high. This will be a beautiful piece of masonry, and will give increased effect to the picturesque views of the Avon valley. The approach to Falkirk presents many fine views of the Carse and the Frith of Forth. The high ground immediately behind Falkirk is crossed by a tunnel of 880 yards, of which 270 are completed, and the drift mines greatly advanced. The view, on emerging from the west end of the tunnel, bursts on the eye with the panoramic effect of a splendid landscape—the foreground—the rich valley of the Forth, with Stirling Castle in the centre—Benledi and the Ochil Hills, marking out the margin of the plain, and Benlomond and the Grampians filling up the picture in the distance—the whole forming an assemblage of objects of surpassing natural beauty. The line, after crossing the Union Canal, which it does on a magnificent arch of 130 feet span, continues nearly level for some miles, is of easy execution, and is partly finished, and possesses no feature of engineering interest, until it reaches the neighborhood of Castlecary, where it crosses the Cumbernauld road, and a deep ravine, by a viaduct of eight arches, nearly 100 feet high—the one end terminating on an embankment, and the other resting on the remains of a Roman camp. Here will be the station for Stirling, and towns to the north of the Forth. The line beyond Castlecary commands an extensive view of the valley. Croymill is the summit of the line, and here there is an excavation of a ridge of whinstone and freestone of considerable depth, presenting no difficulty, however, but what time may overcome. At Cowlairs, near Glasgow, will be erected the engine establishment; and here the fixed engines will be placed to work the tunnel to Queen-street. The incline will be about 2,000 yards, consisting of open cut and a tunnel, divided by eyes into three portions of 550, 300, and 298 yards. From the head of this incline to Edinburgh, the ruling gradient is 1 in 880; presenting, in the facility and cheapness of working it, almost all the advantages of a level line, of which two-thirds are nearly level. The distance being forty-six miles,

the mail trains will easily run it in one hour and a half. Upwards of 400 yards of the tunnel are completed, and upwards of 200 yards of Guide Mine is carried forward. The contracts are all let to be completed by the 1st August, 1841, and the engineer is directing his energies to realise the opening of this great national undertaking by that time. Much work is done, and this has been greatly advanced by the late fine weather, but a great deal is still to do. There are employed on the line, however, upwards of 8,000 men, horses to correspond, and ten or twelve fixed engines; and, if the weather prove auspicious, this force is adequate to the work.

NUISANCE CAUSED BY THE NOISY MACHINERY USED ON THE BLACKWALL RAILWAY.—On Thursday evening, a meeting was held in the parish of St. George-in-the East, to take into consideration the great annoyance occasioned to the parish, by the noise of the machinery used on the Blackwall railway, when a resolution to the following effect was proposed, and carried unanimously: —"That it was the opinion of the meeting, that the machinery used by the Blackwall Railway Company was a nuisance to a large portion of the rate-payers, and that, unless such nuisance was abated, the parish would materially suffer, as it would cause the houses to be untenanted, and thereby increase the burdens, while it would decrease the value of property."—It was also proposed and carried, "That if the directors of the company, on application from the churchwardens, did not devise means to abate the nuisance, the most efficient means should be adopted to compel them, by indicting them for a nuisance."

RAILROAD TYRANNY.—*To the Editor.*—Sir,—As the Legislature have now a bill before them relating to railroads, perhaps you will find room in your universally read paper to call the attention of members to one of the evils suffered by individuals who possess property adjoining these intended speculations, by the wanton exercise of a right over such property. I am one of those unfortunates who have been put to the expense of nearly £600 in defending such property before committees of Lords and Commons, and when you reflect for a moment how these committees are appointed, you will not be surprised to hear that my exertions have been useless and unsuccessful. The evil I complain of is, that these companies print in the schedule of their intended acts a much greater number of houses and premises than they have occasion for or intend to take, the consequence of which is, that the occupiers give their landlords immediate notice to quit as soon as they see their houses marked for destruction, and look out elsewhere; no new tenants can be found to take them under such circumstances, and yet these railroad speculators are not liable for such damages. Surely the Legislature ought to compel them to purchase all property that they schedule, and thereby, in some degree, mitigate the evils that arise from the cause which I have described, Your's, A SUFFERER.

SEINE AND VERSAILLES RAILROAD.—The railroad by the left bank of the Seine to Versailles, notwithstanding the loan of five millions given it by government, has been menaced by failure, in consequence of the ground continually falling in near the viaduct of Fleury. The height was evidently too great to fill with earth, and expense in masonry was not to be thought of. Piles have, therefore, been driven into the chalk stratum, and the road will run for a space upon a wooden platform.

NAPLES.—DREADFUL RAILWAY ACCIDENT.—Private letters from Naples bring accounts of a shocking accident, which took place on the 26th of June on the railway constructed between Naples and Portici. Although the rail was not entirely finished, notice was given that a journey was to be performed on that part which was finished, and the public went in crowds to obtain tickets. His Majesty and all the Royal Family were anxious to join in the journey, but owing to its being of a dangerous nature were persuaded not to venture. The Prince de Salerno was also prevented, having been taken ill an hour previous to the starting of the train; the number of persons who entered the carriages is not as yet exactly ascertained, but supposed to be from 100 to 300 persons. A short time after their departure, the conductor was seized with apoplexy; the machine, being deprived of its guide, went with great rapidity to the end of railway which was finished; unfortunately, there was a bridge not half covered, which went over a torrent, when the carriage, with the whole of the persons in it, were precipitated into it. It is stated that 20 persons were killed on the spot, and all the others dangerously wounded.

GRATUITOUS COPIES

of our Journal have been forwarded to a number of Individuals interested in some Patent, or Invention, of which notice has been taken in our number of to-day.

TO CORRESPONDENTS.

We shall, at all times, be ready to ANSWER QUESTIONS *that may be put to us, relative to any of the subjects indicated in our title; and questions put during the current week, will be replied to either the same, or following week.*

"THE INVENTORS' ADVOCATE, *and* JOURNAL OF INDUSTRY," *may be forwarded,* postage-free, *to all the undermentioned places:—*

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For the convenience of persons residing in REMOTE PLACES, *the* "INVENTORS' ADVOCATE," *will be regularly issued in* MONTHLY PARTS, *stitched in a handsome wrapper.* PARTS 1 *to* 13, ARE NOW READY.

ADVERTISEMENTS *should be sent in not later than* Thursday Evening.

"A Lover of Science."—*The objectionable article referred to in our last, and to which, as honest journalists, we could not give insertion, has been returned to the writer, as requested.*

"N."—*Unless you can produce more satisfactory and substantial evidence than that with which you have already furnished us, your case is hopeless. However just and equitable you may feel your case to be, yet you must be aware that, unless supported by very strong evidence, it would fall to the ground.*

"R. Smithson," Glasgow.—*You must go more into particulars, before we can confidently answer your question.*

"J. Gosling."—*It will be necessary to proceed with great caution, as a host of unprincipled persons are always on the look-out to entrap the unwary.*

"E. Saunders."—*Will our Correspondent oblige us with a personal interview?*

TO OUR SUBSCRIBERS.

TWO *numbers of the* "INVENTORS' ADVOCATE" *(Nos.* 48 *and* 49*) were published* July 4. *The former contains, in addition to the usual varied matter, the* TITLE PAGE *and* a Copious INDEX *to the* SECOND VOLUME.

VOLUME II. *of the* "INVENTORS' ADVOCATE," *handsomely bound, is* NOW READY. *A* FEW COPIES *of the* FIRST VOLUME *still remain on hand.*

TO INVENTORS.

ALL PERSONS who may be desirous of TAKING OUT PATENTS, or of bringing VALUABLE INVENTIONS into USE, are requested to APPLY to the PROPRIETORS of "THE INVENTORS' ADVOCATE," (DELIANSON CLARK & CO.) at their "PATENT AGENCY OFFICE FOR ALL COUNTRIES," 39, CHANCERY LANE, where they may be consulted, daily, relative to the PATENT LAWS of GREAT BRITAIN, and ALL OTHER STATES.—(See ADVERTISEMENT on the last page of the present Number.)

THE

INVENTORS' ADVOCATE,

AND

JOURNAL OF INDUSTRY.

SATURDAY, JULY 25, 1840.

The fourth report of the committee on railways, which we inserted last week, deserves serious consideration; not from the importance of the information it contains, nor from the value of its opinions and remarks, but as a lamentable evidence of the narrow-minded and prejudiced view of the subject, taken by a body of men appointed to consider the means of obtaining for the public those advantages from railway communication, which they have a right to expect. On reading the report, it might be supposed that it was drawn up by a conclave of railway directors, who endeavor to divert attention from the real grievance of the high fares charged by themselves, by an outcry against the government system of taxation, an evil, at the most, utterly insignificant compared with the exorbitant charges of the railway directors.

We perfectly agree with the committee in condemning the principle of fixing as high a duty on the second and third class passengers as is charged on the highest fares; but after all, the mileage duty of one eighth of a penny per mile constitutes but a very small fraction of the charge for conveyance by most railways. Judging from the conduct pursued generally by the directors of railways, our impression is, that if the duty were removed

altogether, the fares would remain the same; for their views seem to be confined to increasing the value of their shares, without consulting the interests of the public any further than is absolutely essential to the advantage of the shareholders.

The committee very truly observe—and we thank them for reminding the public of the fact,—that the great advantage to result to the laboring classes from the establishment of railway communication, was repeatedly urged as an argument in favor of those undertakings before they were commenced. "To convey the laborer cheaply and rapidly," observes the report, "to that spot where his labor might be most highly remunerated, was frequently stated to be one great benefit which would be derived from opening these new channels of intercourse; while, it was added, that the health and enjoyment of the mechanics, artisans, and poor inhabitants of large towns, would be promoted by the facility with which they would be enabled to remove themselves or their families into healthier districts and less crowded habitations." But instead of these promises having been realised, the fares now demanded are nearly equal to the former conveyance by coach; whilst, as the committee state, "the establishment of railway communication has superseded, and in some cases destroyed the conveyance by means of wagons, vans, and carts, which afforded a cheap, though dilatory mode of travelling to the laborer and his family." It is thus admitted, by the committee themselves, that one of the great benefits proposed by railways, has not only not been attained, but that they have, as at present regulated, inflicted serious injury on the class whose advantage was urged as a strong argument for their formation.

Admitting therefore, as the committee do, that the conveyance by railroad is far too expensive, and that the laboring classes have been in a great measure deprived of their former cheap conveyance by wagon; what is it that they propose in this report as a remedy for this crying evil? Nothing, in short, but an alteration of the system of taxation, the effect of which would reduce the duty on the lowest class carriages less than sixpence in a journey of 100 miles! That this is really the extent of benefit to be derived from the plan the committee recommend, may be seen on reference to the fares charged between London and Birmingham. The charge by the second class carriages is one guinea, and the mileage duty on each passenger is about fourteen pence, or six per cent on the fare, and the proposed reduction by the graduated scale would not effect a diminution of more than one-third, which would be less than fivepence between London and Birmingham. And this is the relief to the laboring classes seriously proposed by a Committee of the House of Commons, as the means of realising the promised advantages of cheap conveyance by railways! It is extremely questionable, too, whether the public would receive the benefit of even that trifling reduction; and the plan of proportioning the mileage duty to the price of the fares, though good in principle, would not, we feel persuaded, produce much, if any, advantage to the public.

The fact of the directors of the Leeds and Selby railway having raised the fares to an extent that greatly diminished the number of passengers, is alluded to in the report, in such a manner as to lead the reader to infer that the directors had been compelled to this measure by the impolitic system of taxation. Not one word is said in reprobation of such an infraction of their duties to the public; and the committee content themselves with expressing their opinion, "that it is inexpedient to continue a system of taxation which tends to separate the interests of the railway companies and of the public, and which will gradually exclude a great number of persons from the benefit of cheap conveyance." The benefit of cheap conveyance will, we believe, never be obtained by railway so long as the directors find they can increase their dividends by raising the fares, as in the case of the Leeds and Selby railway, and so long as such injustice to the public is permitted to pass without animadversion by a committee selected from the representatives of the people to watch over their interests.

It is mentioned in the report, as evidence against the impolitic system of railway taxation, that on some of the Scotch railways the duty amounts to one-tenth, and, in one case, to one-sixth, of the whole fares, whilst on the London and Birmingham railway the proportion is one twenty-second. It might be supposed from the manner in which this fact is stated that the mileage duty charged on the Scotch railways is actually higher than on those of England; the duty is, however, in both cases the same, and the effect of one charge being more than double the other must be ascribed to other causes than the oppressive nature of the tax. These causes are not, however, alluded to in this report of the committee, who make no remark whatever on the management of railways, by which the advantages of those means of conveyance are withheld from the public. There are some other points in the report well deserving notice, to which we have not this week space to allude, and we shall probably renew the subject in our next.

THE PROBABLE DURATION OF COAL IN ENGLAND.

There is no question of greater importance to the interests of this country, than the consideration whether the supply of coal from our different coal fields is likely to be exhausted by the increased, and rapidly increasing, demands on them. It is to the abundance of excellent mineral fuel we possess, that this country is principally indebted for her manufacturing superiority, and if there be any probability of this resource failing, such a prospect must necessarily occasion serious disquietude.

It is supposed that the quantity of coal now consumed annually in Great Britain and Ireland, and exported to foreign countries, does not amount to less than 30,000,000 tons. The quantity consumed in 1827 is estimated in a report of a committee of the House of Commons, as under:—

	Tons.
Domestic consumption and smaller manufactures	15,000,000
Production of pig and bar iron	3,850,000
Cotton manufactures	800,000
Woollen, linen, and silk ditto	500,000
Copper and brass manufacture	450,000
Salt works	300,000
Lime works	500,000
Exported to Ireland	750,000
Ditto to colonies, and foreign parts	600,000
Total	22,750,000

When the great increase in the manufacture of iron, the consumption of coal in steam navigation and on railways, and the addition to the population during the last twelve years, are taken into consideration, the estimate of 30,000,000 tons for the present annual consumption, is, we conceive, rather below than above the real amount. It may be very safely taken for granted, that, unless some substitute for coal as fuel be discovered, the consumption will go on increasing; and as coal is a natural product which undergoes no sensible augmentation within the history of man, it is evident that a time must come, sooner or later, when the whole stock of combustible mineral in the country will be exhausted.

Various calculations have been formed with

a view of ascertaining the probable duration of the English coal fields, and it may be interesting to know the data on which they rest. Though nothing like an accurate estimate can be made on the subject, there are some foundations for forming an opinion sufficient to dissipate the fears of the greatest alarmist, as they prove that the stock of coals is large enough to supply the present demand for upwards of one thousand years at least.

In the first place, it must be observed, that coal strata are generally of a concave shape, as if they had once formed the bottom of lakes, where the vegetable matter, afterwards converted into coal, had been deposited. The extent of a coal field of this kind can be readily known as the coal strata "crop out," as it is called, at the edges of concavity, and the limits of the coal bason is thereby perceived. Another fact, which assists greatly in ascertaining the quantity of coal underground, is, that the same stratum of coal is almost invariably of one thickness throughout its whole course, and, excepting it be cut off by "faults," the continuance of a known stratum of coal of the same thickness may be relied on. The number and thickness of the strata in a coal field, can be ascertained by boring through the whole. When, therefore, the space occupied by the coal beds is known, and the thickness of the strata is also ascertained, the quantity can be calculated with tolerable accuracy. The great difference that exists in the estimates of geologists respecting the duration of coal, arises generally, not from any doubt as to the extent of the strata, but from difference of opinion as to the probable consumption, and the waste in working. In the History of Durham, by Mr. Bailey, it is stated that one-third of the coal in that district has been already got, and that the supply will not last more than 200 years. This, however, is by far the lowest estimate that has been formed, and Professors Buckland and Sedgwick agree in thinking that the Northumberland and Durham coal strata will, at the present rate of consumption, last nearly 400 years. Even this period, long as it seems in reference to individual existence, is but a short space in the history of nations, and were there no other source of supply, the British patriot, who cherishes the fond hope of England's continued greatness for many future ages, would have good cause for alarm. There is, however, another source whence coals can be procured, of much greater extent than the coal strata of Northumberland and Durham, and which, when those are exhausted, may be worked with advantage for a further succession of ages. The coal field in South Wales extends over a surface of twelve hundred square miles, and its numerous strata of coal average a thickness of nearly one hundred feet. The quantity of coal under each square mile of surface is calculated at 65,000,000 tons, and after making the most liberal allowance for waste, the coal under each square mile would more than supply the present annual consumption; that is to say, we have in the Welsh coal strata alone a reserve supply for 1,200 years, after all the coal fields in England have been exhausted.

The importance of coal to our national prosperity, and the necessarily limited nature of the supply, have induced many persons to recommend the prohibition of its export. If a restriction of this kind be in any case adviseable, it seems, indeed, that it might be applied to such an article as coal with greater propriety than to any other; and were there any fear of deficiency, the question would deserve serious consideration. In the present circumstances, however, with a prospective supply before us for 1,600 years, there would be no good policy in adopting such a course, while it would be fraught with danger. The principle, which, in a former article, we endeavored to enforce, viz., that all peculiar natural products are held in trust by the favored nation for the benefit of the whole world, would apply with peculiar strength to so important an article as fuel, and if the supply of coal from England should ever become essential to the continental states, and it were withheld from them, this country would soon be made to feel that the possession of hoarded and envied riches is a treacherous foundation for national prosperity and safety.

NEW INVENTIONS.

WESTHEAD'S FACILE DIVESTER CORSET.

The inventor of this most useful improvement on the inconvenient and badly-constructed stays worn by our fair countrywomen, deserves our best word. He has conferred a boon on society, which will not soon be forgotten.

The simplicity of Mr. WESTHEAD's improvement is such, that one is only astonished that so many centuries should have elapsed without so happy an idea having been before hit upon.

We are well aware how many ladies there are, who *will* lace themselves tightly, against all remonstrances to the contrary; they may still do so, by using Mr. WESTHEAD's corset, if it be their pleasure: should they, however, be over-tightly laced, and should respiration be thereby impeded, as is very frequently the case, instantaneous relief may be obtained by simply pulling a string, conveniently attached to the back of the corset, whereby freedom is given to the body, by the liberation of the lace from every separate hole.

The improvement can be adapted to stays generally, but it would of course be desirable that the corset, as well as the improvement, should be furnished by the inventor. They are laced in the usual manner, and differ nothing in the adjustment from those in present use.

NEW AIR PROPELLER.

The *Journal des Débats* mentions the discovery of a new means of obtaining a *point d'appui* on the air, so as to make it available as a re-acting power in propelling boats, carriages, &c. This discovery has been submitted to the Academy of Sciences, and a commission has been appointed to examine its merits; M. Arago, it is said, approves of it very highly. The inventor, M. Eugene de Fresne, who is a young man, exhibited the power of his engine in a boat on the Seine, a few days ago, in the presence of a number of scientific men. The boat moved up and down the river, against wind and stream, without oars or sails, having only a sort of air-wheel fixed where the sails are usually placed. The inventor was seated behind, and on giving the apparatus a rotary motion, the boat moved forwards. The principal advantage expected to be derived from this air-wheel in practice, is in navigating canals with steam-power, as the boats will not occasion such an agitation of the water as paddle-wheels. M. de Fresne has also constructed a wheel on the same principle, to act under water, and it is expected that this mode of propelling steam-vessels will be more economical; that it will not be deranged by a heavy sea; and will also be out of the reach of cannon shot in naval warfare. It is also said that the same apparatus is applicable for the direction of balloons, No description of the wheel is given, nor is the principle of its action stated, but we gather from the account of it in the *Journal des Débats* that it is an upright vane, acting like the sails of a windmill, similar, in point of fact, to the kind of vane mentioned in the *Inventors' Advocate* some months ago, as applicable for gaining a hold on the air, and which has since been adopted by Mr. Green as a means of guiding his balloon.

KEENE'S NEW WATERPROOF LEATHER.

There has hitherto been very great difficulty in procuring leather sufficiently soft for tender feet, that would at the same time keep out rain and damp. The nearest approach to this desideratum, has been buckskin leather, but this has only proved serviceable in dry weather, it being easily accessible to water in consequence of its not being tanned. Caoutchouc, or Indian rubber, has also been introduced, but this has not been found to answer, owing to its thickness, and the difficulty of moulding it into any thing like a handsome shape. Mr. KEENE's new waterproof leather provides for all previously-existing difficulties, and is so simple that it may be applied to almost every article of wear, such as gloves, boots, shoes, caps, cloaks, overalls, &c. &. The fabric is wash-leather, the surface of which the inventor has prepared with a strong coating of a peculiar India rubber mixture, that not only renders it perfectly waterproof, but at the same time sufficiently strong for all purposes of wear and tear.

All persons having tender feet, and suffering from corns and bunions, will do well to seek relief by the use of Mr. KEENE's waterproof leather, which will speedily become an article in general request.

NEW MODE OF PROPELLING STEAM-BOATS.

An ingenious mechanic, residing at Grahamstone, near Falkirk, has been for a long period engaged in constructing a small vessel to be propelled by means of pressure pumps—the application of a principle quite new to the masters of this science. On Monday evening the boat was launched into the Forth and Clyde Canal, at Bainsford Bridge, and pro-

ceeded beautifully along the reach at a rate of not less than 15 miles per hour, conducted alone by the inventor, who worked the pumps. This novel invention has produced much speculation among the members of the profession in this place; and it is now reported, that he is so much satisfied with his first experiment, that another on a larger scale is forthwith to be undertaken, and a patent procured to protect the invention. He has no doubt that it will, at no distant era, entirely supersede the present mode of propulsion by means of paddle-wheels. —*Greenock Advertiser.*

NEW RAILWAY LOCOMOTIVE.

This invention is constructed by Mr. Walter Hancock, of Stratford, Essex, and is now on trial on the Eastern Counties Railway. One of its principal advantages is presented in the boiler, by which steam of greater power is generated with far greater certainty of continued supply, and more perfect safety than by the boilers now in use, either in railway, marine, or stationary engines. The boiler is constructed of a number of distinct chambers, each chamber composed of several tubes. Each chamber, or rank of tubes, connects with two general cylinders or reservoirs—one at the bottom for the supply of water, and the other at the top for the reception and passage of steam. The communications from each chamber to the water, steam pipes, or reservoirs, have self-acting valves. When any leakage occurs, from wear, rents, or other causes, to any one chamber, the valves belonging to it close, and are kept to their seats by the pressure of the water and steam contained in the neighboring sound chambers, and the boiler remains as effective as before, excepting that the surface of that one chamber is thrown out of use, without stopping the engines, and perhaps it would not be observed by the engine driver until the end of the trip, when the pressure being reduced by withdrawing the fire, the valve would fall from its seat, and point out the defective chamber by the discharge of water. In half an hour, a new chamber could be attached in its stead. In the ordinary locomotive boiler, when any one of its tubes becomes defective, the whole is rendered inoperative, by reason of the unchecked communication of all the parts with each other, and so it remains, until the defective tube is repaired, replaced, or plugged, which generally occupies three or four hours, and is attended besides with the inconvenience of stopping the train until another engine is procured from the next station.

By adopting the improved boiler, no such delay would occur, and the expense, both in fuel and wages, of keeping a number of engines with their fires up ready to meet such casualties, would be avoided, as well as the risk when a train stops out of time, and having another train brought in collision with it, and the lives of passengers and attendants endangered.

The great heating surface obtained in a comparatively small space, is likewise a recommendation to this boiler . It is intended to attach a reciprocating set of fire-bars to it, by which a clean floor of bars can be introduced without lowering the fire. The small weight of this boiler in comparison to its generating power, is another material point in its favor, for it leaves room for giving sufficient strength to all other parts, without exceeding the present total weight of a locomotive.

Having given a general description of the power —the engines and machinery come next under consideration.

The engines of the present locomotives are placed horizontally, and are thereby very much confined and difficult of access, but in this one they are vertical, and therefore the whole of the machinery, pumps, &c. are open to view, can be readily oiled, and speedily detached for repairs; or any portion may be put right and secured while the engines are working.

The engines of this locomotive give motion to a separate crank shaft, and this communicates the progressive motion to the wheel axle by an endless chain, working over a pulley fixed on each, and which two pullies may be either of equal or different diameters, so that advantage may be obtained either for speed or power, whichever may be required. This arrangement not only allows the wheel axle to be straight instead of cranked, but it also possesses the advantages of a moderate accommodation or play, by which all sudden jerks or concussions of the machinery, &c., are avoided.

The friction is reduced above one-half, from such large eccentrics, crank-bearings, &c., not being required, in consequence of the weight of the machinery, boiler, &c. being on straight instead of cranked axles.

This arrangement allows the work to be immediately thrown out, so that the engines will work the injection pumps, and get up the fire, without working the driving wheels. By running locomotives about to effect these purposes, much of unnecessary wear and tear is incurred, besides running on the rails in the way of trains, &c. The present locomotive need not stir from the spot until the train is attached—the clutch then thrown in, it immediately starts upon its trip.—*Railway Times.*

SCIENTIFIC MEMORANDA,

AND

NOTES ON ART.

Model of the Pyrenees.—Mr. Biefield, of Wellington-street north, has just completed a map of the Pyrenees, in *papier machee*, which forms a complete model of these mountains and the rivers and forests which are interspersed amongst them. It is from the elaborate model of Sir T. L. Mitchell, and is an admirable bas-relieved map of that celebrated district, which has so often been the seat of deadly conflict, and in which, during the Peninsula war, so many opportunities were given for the display of British valor. This cast or model is an immense improvement upon common maps; it shows the undulating surface of the country, the vast hills, the narrow vallies, the thick forests, and the almost labyrinthian windings of the rivers. The whole conveys an accurate idea of the enormous barrier by which the peninsula of Spain is divided from France. The passes in the mountains, and the roads, are marked with great accuracy, and afford, almost at a glance, a knowledge of the relative positions of military posts and the difficulties attending military movements in such a locality. It furnishes a mode of studying military geography, far superior to the old plan of a printed map on a flat sheet of paper.

Coincidence between the Pulsation of the Human Body and the Hour of the Day.—To the Editor of the Sun.—Sir,—The coincidence between the hour of the day and the pulsation of the human frame, may be unknown to many of your readers, and as it is illustrated by a very simple experiment, which any one may put to the test, perhaps you will allow me a fraction of one of your columns, in order to call their attention to it. Seat yourself at a table; having placed your elbow on the table, attach a piece of metal (say a shilling) to a thread, hold the thread between the points of the thumb and first finger, and allow the shilling to hang suspended in the centre of a tumbler glass: the pulse will immediately cause the shilling to vibrate like a pendulum, and the vibration will increase until the shilling strike the side of the glass. Suppose the time of the experiment be that hour at which I am writing—between half-past *six* and half-past *seven* o'clock—it will so strike the glass *seven* times, and having done so, lose its momentum and return to the centre.—If you hold it a sufficient length of time, the experiment will be repeated, but not until a sufficient space have elapsed to convince you it is most complete. I need not say the thread must be held with a steady hand, otherwise the vibratory motion will be counteracted. At whatever hour of the day or night the experiment be made, the coincidence will be found the same. Should any of your scientific readers dispute the fact, you are at liberty to furnish them with my real address, when I will hand them a sketch and explanations that will satisfy them.—I am, Sir, your daily reader,

Manchester, July 17, 1840. SECRETARIUS.

College for Civil Engineers.—This laudable institution, the opening of which in May last we noticed at great length in our Journal, is fully realising the most sanguine expectations of its founders. So greatly has it increased, that the council have found it necessary to remove from Kentish Town to very extensive premises at Putney, which they have purchased; the premises consist of two estates, known as "Putney House" and "The Cedars" near Putney-bridge, on the banks of the river. The ground consists of 20 acres.

Silk Weaving.—One of the most extraordinary specimens of silk weaving ever executed, was exhibited at Mr. Morrison's late Couversazione given to the Members of the Institute of British Architects. It was a portrait of Jacquard, representing that extraordinary man in his workshop, surrounded by his implements, and planning the construction of that beautiful machinery, which now, in its increased perfection, returns this testimony to the genius of its inventor. This work, worthily entitled, "*Hommage à J. M. Jacquard,*" was woven with such truth and delicacy, as to resemble a fine line-engraving: it was executed by Didier, Petit, and Co. We learned that there were 1,000 threads in each square inch (French), in both the warp and the woof; and that 24,000 bands of card were used in the manufacture, each band large enough to receive 1,050 holes. Owing to the black threads passing under them, the tone of the highest light was grey, though this was scarcely perceptible. The great difficulty to be overcome, was, it is said, the keeping the broad margin round the picture perfectly even in color, and regular at the lines forming the edge of the picture.

A Marvellous Machine.—The Foreign Journals state, seriously, that an inhabitant of Pesth has invented a machine, that has been approved of by the Academy of Pesth, by means of which the services of compositors may be dispensed with. An ordinary workman, it is said, may compose eighteen large folio pages in a day, and distribute the types by merely turning a wheel, which causes all the words and letters to return to their respective cases.—[The Foreign Journals appear to be amusing themselves at the expense of some poor unhappy mechanic.]

The New Houses of Parliament.—Mr. Charles Barry, the architect of the new houses, has had several interviews with Viscount Duncannon and the Hon. Mr. Commissioner Charles Gore, on the subject of laying the foundation stone of the buildings for the Lords and Commons, and it has, we understand, been definitively arranged that the ceremony is to be postponed until early in the ensuing year, when it will probably be laid by Her Majesty. Mr. Barry stated to the commissioners, that the houses will be completed by the commencement of the session 1844. The workmen, of whom there are nearly 500, are still employed under the contractors in constructing the Speaker's house, Usher of the Black Rod's, and Parliamentary offices, which by the end of the present year will, in the opinion of the architect, be 20 or 30 feet from the basement.

Museum of Versailles.—A new suite of galleries has just been opened at the Museum of Versailles, adding considerably to the interest of that vast collection of historical paintings. The new galleries are on the second floor of the Palace, and occupy the whole extent of the south wing, where also is the gallery of battles. They correspond with the portrait gallery, which is between the chapel and the opera, in the north wing. The new collection includes all the members of the Imperial (Bonaparte) family, as well as many sovereigns and distinguished personages of the period, several Popes, the late Sultan Mahmoud, the Schah of Persia, and other public characters, whose features are at once recognised.—*French paper.*

The Polytechnic Institution.—A day passed at this establishment, especially by the young, is a day well spent. There is to be seen much that will delight, and much that will improve. Upwards of 1,100 works of art are deposited in the galleries of the institution, the contemplation, or rather the examination of which, must be attended with an increase of knowledge by those who seek it; and in the Polytechnic Institution it is to be sought and found in the most pleasant way, for instruction and amusement go hand-in-hand together. The latest introductions are, a large sectional model of a steam-engine, by which the whole of the *modus operandi* of that gigantic power is made comprehensible to every body; a model of the novel pump, by which a continuous stream of water is elevated from any depth by a single belt or tape, put in motion at the rate of 1,000 feet per minute; a room full of Daguerreotype views taken from the most celebrated scenes on the Continent; a series of balloon experiments, intended to show the contemplated improvements in aerial navigation; a beautiful little boat, fitted up with sub-marine propellers, having for their object the annihilation of the major part of the inconveniences and dangers to which steam navigation is at present exposed; and finally, the Alpine singers, whose Tyrolean airs are always heard with pleasure. As a most useful as well as agreeable exhibition, the Polytechnic Institution deserves well of the public.

Manufactures.—Silk weaving was first introduced into Middleton (Lancashire) in 1778 by a family of the name of Fallows, who was employed by a Manchester firm. It is estimated that there are at present in the township of Middleton, upwards of two thousand hands employed in the silk trade, about one thousand females, seven hundred males, and three hundred young persons. The description of goods chiefly manufactured, are plain sarsnets. The admirable loom by Jacquard is in general use for figured goods, and a large number of these looms or machines are made in Little Park, near Middleton. The silk weavers are principally employed by Manchester manufacturers. The cotton goods wove by hand, are principally ginghams and nankeens, and those by power, chiefly calicoes. Power-loom weaving is carried on at two factories in the town. In 1839, the number of cotton factories or concerns in the parish was 12; woollen, 2; total 14. The aggregate power of the steam-engines was 468, and of water wheels 31; total 499. The number of workers in the cotton trade under twenty-one years, was 1613; above twenty one, 924; total, males, 974; females, 1563; entire total, 2537. The number of hands in the woollen trade was 26. The cotton manufactories of the parish which are not in Middleton township, are in Birtle-cum-Bamford, Ainsworth, and Hopwood. Calico printing is extensively carried on at Rhodes, about a mile from the town, by Messrs. Salis, Schwabe, and Co.; silk dying, in the southern part of the town, by Mr. Walter Beattie; and Turkey red dying at Boarshaw Clough, a short distance to the north-east of the place, by Messrs. Adam Raumgartner and Co. There are calico printing works in Pilsworth and Ainsworth, and bleaching works in Thornham and Great Lever. The ample supply of water, and the abundant

supply of coal in every portion of the parochial district, has been a material cause of the establishment of cotton manufacture, and its subsidiary branches.—*Historical Notices of Middleton, by E. Butterworth.*

Free Exhibition by British Artists.—We are glad to learn that a number of British Artists have determined to make an attempt to release themselves from the shackles of the present exhibition, and to benefit themselves, and attempt to create a general love of art in their countrymen, by opening to the public a free exhibition, A prospectus of these plans is in circulation, and Mr. Park, the Sculptor, of 8, George-street, University College, has undertaken the conduct of them.

The Great "Nassau" Balloon.—The bankruptcy of Messrs. Gye and Hughes, of Vauxhall Gardens, has caused the *monstre* balloon to be in the market. It was "knocked down," on the 17th instant, to Mr. Charles Green, the "Columbus of the Skies," for £500.

VARIETIES.

Breakwater at Brighton.—Sir Samuel Brown (the projector of the Chain Pier) is at present at Brighton, engaged with the boats belonging to the Pier, in taking soundings and ascertaining the practicability of constructing an asylum harbour, or smooth water roads, by means of an extensive breakwater. There can be but one opinion as to the importance (indeed we may almost add imperative necessity) of an undertaking of this kind; for there is no harbour or roadstead, nor any protection whatever, for ships or vessels, particularly the most numerous and most ill-appointed class of coasters, bound either up or down channel, between Dunnose Point in the Isle of Wight, and Beachy Head, a distance of upwards of 60 miles, during the heavy storms from the south-east and south-west which prevail on this part of the coast. The construction of a breakwater on this or any other part of the coast, for the purpose of affording refuge from the storms to which all denominations of ships are at times inevitably exposed, is an object sufficiently important in itself to justify its construction.

A Bill for the Regulation of Railways is at present before the House of Commons, and was considered in committee on Thursday; when most of the clauses were agreed to. The object of the bill is to protect the public from personal injury, and to place the affairs of railway companies under the inspection of the Board of Trade. A good deal of opposition was made by some of the members connected with railways, to the principle of the bill, as an infraction of the rights of private companies; but the majority of the House of Commons is in its favor, and Sir R. Peel boldly avowed that, when any company derives peculiar privileges from Parliament, their affairs ought to be liable to Parliamentary regulation.

New Mode of Planting Potatoes.—A correspondent of the *Fanal*, who represents himself to be an experimental gardener, says, that great advantage may be gained in planting potatoes by allowing the pieces that are cut for planting to dry, by spreading them on a floor for about eight days. He states that when he pursued this plan, not one of the pieces failed, whilst others which he planted at the same time, freshly cut, all rotted in the ground, and he was obliged to plant others in their place. Another fact relative to the planting of potatoes, is mentioned by a correspondent of *L'Ami de l'Ordre*, which is of considerable importance as regards the utritious quality of that valuable root. He states, that potatoes planted late in the year and gathered early, for the purpose of sowing corn on the land, do not possess the same quantity of nutriment as potatoes that are planted in March or April, and gathered at the end of October, and are also injurious to the health; the potatoes that have not had time to ripen in the ground, have not the power of germinating the succeeding spring.

Ancient Tomb.—A Paris scientific journal gives an account of the discovery of a stone sarcophagus, while digging a sepulchral vault in the ancient sacristry of the Abbey of Montierneuf. The body is shaped from a single block, and the lid formed of several pieces, joined together; it gradually narrows from the head downwards; the place for the head is marked by a semi-circular recess, cut in the stone; and the blocks, of which the lid is composed, are in a state of almost natural rudeness. The entire consumption of the human body prevents all observation as to the manner of interment. The sarcophagus contained none of those vases filled with perfumes which it was customary to deposit in places of sepulture prepared within dwellings, or in their immediate neighborhood, but only some fragments of a small metal spoon. From researches made by M. Lacroix, the curate of Montierneuf, it seems probable that this sarcophagus contained the remains of William the Second, abbot of Montierneuf, who died towards the close of the thirteenth century. Besides the sarcophagus, some Roman coins, and several of the Middle Ages, were likewise discovered.—Speaking of discoveries, we may mention a pleasant one, made by a proprietor of the town of Aire, in Artois, of a gold ring, enriched with several diamonds, of great value. It is of remarkable beauty, but very ancient form. The fortunate proprietor is said already to have refused 15,000 francs (£600) offered by an Englishman.

Iron Brig.—Considerable interest has been excited in the Thames by the arrival of the collier iron brig, Vulcan, of Sunderland, lying off Rotherhithe, it being the first that has discharged her cargo in this river—at least so we are given to understand—the great advantage said to be fulfilled in this vessel, is, its much greater buoyancy over those constructed of timber, and it is consequently much better adapted to contain a larger cargo in the same bulk. We are also informed that the hull is separated, in case of accident, into several compartments by means of iron partitions, so that if the vessel should become damaged in one or two places, the water would only enter one or two of the partitions, and the remaining ones are sufficiently buoyant to prevent the vessel from sinking. Her appearance is very sightly, we might almost say handsome. We presume that the captain of this vessel cannot avail himself of a compass, judging at least from the several trials which have recently been made by those having command of iron steamers.

Emigration.—A number of framework-knitters have emigrated to the United States during the last week or two, and others are about to follow them. Their place of destination is German Town, near Philadelphia, where there is a large manufactory for hose, gloves, &c., carried on by a Quaker.—*Leicester Chronicle.*

Progress of "Invention."—A notice has been issued by the Lord Mayor, that Blackfriars Bridge, owing to its being under repair, will be closed to carriages and omnibuses for the next six weeks. In consequence of this, the Islington and other omnibuses plying to the Elephant and Castle, Clapham, Brixton, &c., are necessitated to pass over Waterloo Bridge, the toll for which is *three pence* each time of passing,—going and coming. An application was made on Wednesday by the proprietors of the respective omnibuses, to the committee of management of Waterloo Bridge, to *compound* for the tolls; but they would not listen to any proposal of the kind, and insisted on prompt and full payment every time of passing. This not exactly "meeting the views" of the omnibus proprietors, they set their "inventive" powers to work, and actually commenced plying for "short passengers," whom they conveyed from the Strand to Stamford-street, for *one penny* (the price of the toll), and *vice versa*! By this *ruse*, the proprietors of the omnibuses have made money, and the Committee of Management have been muleted of many pounds. Wednesday last will long be remembered by us; we never before had a *penny*-ride in an omnibus.

The President Steam Ship.—(From a Second Edition of the *Liverpool Albion* of Tuesday).—The *President* has arrived, after a remarkably quick passage and fine run of ten hours from Kingston, which she left this morning at a quarter past three o'clock. The wind was west, and a smooth sea. Canvas was set soon after she left Kingston, and it was used during nearly the whole passage. Last night about seven o'clock, the second cook, who had spent the day on shore, was returning to the *President* in a cock-boat, rowed by a boy. Owing to the darkness of the night, the boat got atwhart of the hawser. The cook and the boy were precipitated into the water. At the moment when both were in immediate danger of drowning, Mr. Duncan, second officer of the *President*, jumped overboard, and after great exertion succeeded in pulling up both man and boy, who were safely brought on board.

Mentz.—On the 4th of July, a steamer arrived at Mentz, for the first time, direct from London.—*Hamburgh Borsenhalle.*

Breaking up of Large Ships.—The large ships which formerly traded between London and China and the East Indies, previous to the repeal of the East India Company's charter, and which formed one of the finest mercantile fleets in Europe, are fast disappearing, and, with three or four exceptions, have been all broken up at the ship-breakers' yards in Rotherhithe. Within the last few weeks, the Asia, of 1,100 tons, which was built at Deptford twenty-nine years ago for the East India Company, and was chartered by that body for the bringing home cargoes of teas from China on several occasions, has been sold to Mr. John Beatson, ship-breaker, in Rotherhithe, and has been recently moored alongside the wharf, where the Temeraire, 104 guns, was broken up in 1838. The upper timbers of the Asia are sound and in good condition, but those between wind and water are much decayed, and she will be broken up forthwith. The laborers commenced the work of demolition on Wednesday, and in a few months, this once magnificent vessel, which has enriched our merchants, and brought home many valuable cargoes, will be entirely dismantled.

Fertility of "Invention."—A circumstance of a novel and amusing nature occurred on Friday in the County Court, before Mr. Sergeant Green, while trying an appeal from a decree obtained by a person named Margaret O'Brien v. Keating, a minor. Mr. Freeman was engaged on the part of O'Brien, the applicant, and having been handed his instructions in court, conceived he was employed for the other party, and accordingly showed that the defendant was a minor, and consequently not liable to be decreed. His lordship agreed with the learned counsel, and the rule was about to be taken down, when he was informed by Mr. Darcy, the attorney for O'Brien, that he had been "in the wrong box," and amidst the laughter of the court, in which his lordship joined, he very gravely commenced altogether upsetting his own argument, and, with the most perfect coolness, *quoted several cases in support of* his new position!! He had, however, done the business too effectually in the first instance, and his client was accordingly *nonsuited* after a very entertaining scene.—*Limerick Chronicle.*

Statistics of Manufacturing at Heywood.—About twenty-five years since, the principal trade in Heywood was cotton hand loom weaving of fustians. In 1817, there were 10 small cotton mills; in 1833 there were 27; the number at present is 34; steam engines, 42; carding engines, 377; power looms, 4,167; spindles, 236,121; the amount of hands directly employed, 5,190. The description of goods manufactured are chiefly velveteens, velvets, beaverteens, swansdowns, pillows, moleskins, &c. About a mile and a half from Heywood, and one mile from Bury, is a large woollen millen mill, 85 yards in length by 75 in width, supported by 2,688 feet of shafting, and 450 gas jets. Cotton handloom weaving at Heywood is almost extinct.—*Bolton Free Press.*

New Steam-boat Pier, George Street, Adelphi.—A new steam-boat pier, extending nearly 300 feet into the river, is opened at the end of George-street, Adelphi, a short distance eastward of Hungerford-market. The George-street pier was much wanted, as the crowding and confusion at Hungerford-market pier is frequently a source of great inconvenience, and on several occasions, accidents have happened there; besides which, the constant assemblage of a number of low fellows at the river end of the market, and their bad language and rude remarks, have been often complained of, and have been a great annoyance to respectable persons, especially females. The approach to the George-street pier, is along a quiet and respectable street, leading from the Adelphi and the market, and its noise and confusion is altogether avoided. The George-street pier is to be confined solely to the accommodation of steam-boat passengers.

Murrain among Cattle.—We are sorry to learn that the murrain prevails very much amongst the cattle and sheep at Redmile, near Belvoir Castle; Mr. W. Parr, a large farmer, has suffered very extensively, particularly by the loss of sheep. The milk of all the cows affected, is thrown away, as it is unfit for use; two cats that lapped a little, had the disease and died.—*Nottingham Journal.* [This murrain among cattle is now very general; so much so, that in many families milk is no longer used.]

French Post Office.—Arrangements have been made by the French Post-office authorities, for accelerating the overland mail for England by special conveyances, direct from Marseilles to Calais. By this plan, it is expected that the India mails will reach London 24 hours earlier than by that hitherto pursued.

Repair of Blenheim Palace.—We are happy to perceive that a bill has been introduced into Parliament, to provide for the repair of Blenheim. We have long regretted the dilapidation of that noble palace, which, with the ample means the estate affords, ought never to have been suffered to fall into its present decay. It would be unfair to expect that repairs of such an extensive nature could be paid out of the income of the tenant for life; and we think that it reflects great credit upon its present noble possessor, that he has so soon directed his attention to the performance of a duty not less important to the interests of his own family than it is to the character of the nation from whom this princely estate was derived.

Curious Deposit on Lands in Gloucestershire.—Mr. H. Paris, grocer, of St. James's-street, in this town, has received from a relation, in Gloucestershire, a piece of a substance resembling cotton felt, which, it appears, has been deposited, or produced, to a considerable extent, over the land in some districts of the above-named country. The following extract from a letter, which Mr. Paris received with this curious production, will put the reader in possession of all the information which we have, relative to the subject:—"I send you enclosed a piece of vegetable cloth. It was taken from the surface of the land, near Leachlade, in this county, and was left, it is supposed, a deposit from the water that was out so much last season. Nothing of the sort was ever known before; but this season, thousands of acres were covered with it, so that the country looks like a white carpet. The farmers were obliged to employ workpeople to rake it up in heaps, and burn it to allow the grass to grow. I can give you no further description of it than this. It certainly is a curiosity, and, perhaps, some of the learned in Liverpool can give some reason for its formation." Mr. Paris has left a specimen of the substance at our office, and we believe, he has taken a piece of it to the Mechanics' Institution.—*Liverpool Mercury.*

Mode of getting rid of Snails.—These creatures are passionately fond of bran, or the outside skin of wheat. When this food is placed out for them, they leave it as seldom as possible; and when they do retire for a time, they eagerly return to again feed on it. This suggests a mode of freeing any piece of ground of them. You have only to place over little heaps of bran, pieces of broken pots, or vessels of any kind, which may shelter the food from the rain, and your work is done. The snails will congregate below, and you can in a short time destroy vast multitudes of them.

The Blazer.—It is only about four years since this Admiralty steam-vessel was built, and her service has been principally in the Mediterranean Sea. On her return to be paid off at the end of last month, she was taken into one of the dry docks in Woolwich Dockyard, and on being examined was found to have her copper sheathing completely incrusted with barnacles, gordian-knotted corals, oysters, muscles, and various other shell-fish, thousands of them alive, and in many places, in clusters several inches thick. This state of the sheathing must have taken place from some chemical action on the copper, which has not yet been accounted for. Perhaps a small portion of zinc may have been inadvertently used in its formation, or in the construction of the nails with which it has been fastened. It is not generally known, that a very small portion of zinc, either by mixture, or by coming in contact with copper, will completely neutralise its quality of preventing the adherence of shell-fish in sea water. Mr. Marsh, a chemist connected with the Royal Arsenal, some time ago prepared two sheets of copper, eight feet long by two feet broad each, and had them made perfectly smooth, and polished with cork and sand. He then placed them in troughs made for the purpose, the one in its pure state, and to the other he attached a small piece of zinc, about four inches square. The troughs were afterwards filled with sea water, taken in barrels from the Nore. In the course of 24 hours, the pure copper acquired a deep green tint like verdigris, losing all its bright-

ness. The other piece remained in the water about four months, without the slightest visible change, or losing any of its original polish. From this fact, it is probable that the green color acquired by the pure copper was of a poisonous nature, and of a substance which renders that metal so valuable when applied for sheathing to vessels. The boreing worm has committed depredations in the timbers of the Blazer, several holes being found, some of them nearly through pieces eight inches thick; but this has been accounted for by the discovery that a portion of the copper sheathing had been torn away by grazing on a rock.—*Times.*

Wood Pavement is about to be introduced into Manchester, Salford, and Leeds.

New Duties.—According to Papers published by the order of the House of Commons, the general duty on Coffee is to be reduced from 1s. 3d. to 10½d., and that on coffee grown in any British Possession from 6d. to 5d., while the duty on coffee merely imported from British ports, within the limits of the East India Company's Charter, remains at 9d. We apprehend that the intention and effect of this alteration will be to cause the coffee of Brazils and other foreign countries, to be imported directly into this country without being sent first to the Cape of Good Hope, and at the same time, to ensure to coffee grown in British possessions its present protecting duties.—*Sun.*

The Manchester Handloom Weavers.—These men, who are suffering great distress, had a meeting on Monday, and adopted the following resolutions in reference to their condition and its causes:—"1. That the distress of the handloom weavers is fully as severe as it was last winter, and, owing to the present advanced price of provisions, is almost insupportable. 2. That our present distress has been occasioned by causes over which we could have no control, but of which we are, nevertheless, the unhappy victims. 3. That the miseries we have labored under for many years, we attribute to the operation of the existing corn laws, and we see no prospect of amendment unless through their total and unconditional repeal. 4. That a deputation be appointed to wait on the authorities, and lay our distressed state before them, and also to convey our grateful thanks to them for their late efforts to ameliorate our condition."

Paris.—Price of Bread.—The present assize price of bread of the best quality in Paris, or the price fixed and ordered by the French Government for the first fortnight of the month of July, is 82½c. for the loaf of two kilogrammes, which, at the actual course of exchange in Paris on London as above, is equal to rather less than 7d. 1-10th of a penny per English 4lb. loaf; or exactly 7d. and nine and a half hundredth parts of a penny. The present highest current price of the best, so called, full-priced bread in London being 10d. for the 4lb. loaf, although in some instances more is demanded, shows that the 4lb. loaf in London is dearer than in Paris by very nearly 3d., exceeding 2d. and 9-10ths of a penny, being 403¼d. per cent.; and that the 10d. which can purchase in London but 4lbs. of the best bread, will procure in Paris five English pounds ten ounces and 1-7th part of an ounce of the finest quality of bread.

LITERATURE.

REVIEW OF BOOKS.

Architectural Precedents, with Notes and Observations. Edited by C. Davy, Architect, &c. Part 4. John Williams.

The object of this publication is to collect together a mass of valuable documents and illustrations on architectural practice, which hitherto have existed in a loose and divided state, and to place before the professor, the student, and the amateur, a library of professional reference of considerable value and importance. The value of a work of this description, depends on the manner of its execution, and the method of its arrangement. Both these appear unexceptionable, and we consider these "Architectural Precedents" worthy a place in the library of every professor, student, and amateur.

REPORTS OF SCIENTIFIC MEETINGS

BOTANICAL SOCIETY OF EDINBURGH.

The third annual report and proceedings of this excellent society, for the session 1838 and 1839, having just come to hand, we take the opportunity of laying before our readers the progress it has made. It must be understood that this society was the first established in Great Britain, for the exchange of specimens with members and other learned bodies, a principle which cannot fail to receive the warmest support from every lover of nature; and it is only surprising to us, that societies for the cultivation of other departments of natural science, viz., Entomology, Geology, Conchology, &c., have not, in some degree, followed in the steps of the Botanical Societies of Edinburgh and London. The latter being founded on the same plan, and having the same end in view, viz., to establish an Herbarium of both British and Foreign plants, for reference, and to exchange the duplicate specimens to the members, in proportion to their annual contributions. Those members who forward the greatest number (and the rarer the more acceptable), receive in return a fair share of the duplicates contained in the society's collection, which they may require to complete their Herbarium;—in addition to the above, papers are read on Botanical subjects, and a library and museum established.

With the usual zeal and enthusiasm of the Scotch, and the encouragement this society has received from scientific men in different parts of Europe, and having, as it were, the University of Edinburgh to support them, and no jealous or opposing body to contend with, it numbered at its last anniversary 265 members.

The number of contributors to the Herbarium, during the last session, amounted to 93. The number of specimens received, after rejecting a large portion of those which were imperfectly or badly preserved, has been estimated by the Curator as follows:—

	species.	specimens.
Foreign Phænoganic Plants, about	1,600	31,500
British ditto ditto	3,300	7,500
British and Foreign Cryptogamic Plants, about.....	280	1,200
Total, about....	5,180	40,200

The number of specimens distributed, after a selection was made for the society's Herbarium, has been computed at about 38,000; viz., of British Plants 30,000; of Foreign Plants, 8,000: these specimens were distributed to 84 members and societies.

In calling the attention of the members to the several donations, the Council begged specially to notice that of the late Mr. William Christy, jun., of Clapham, Surry, received in June last, consisting of the remainder of his Herbarium, and comprising about 1,100 specimens of British and Foreign Plants, making the whole contribution to the Herbarium from Mr. Christy now amount to the very large number of 16,000 specimens, and that a great portion of these were previously desiderata in the society's Herbarium.

In accordance with our intention of giving, during the summer recess of the learned bodies of the metropolis, a list of the communications, with the names of the authors, read at the principal societies, whose objects are connected with our Journal, and which cannot fail to prove of service for reference at the present or future time to our readers, we defer subjoining the account of the communications read at this society until another opportunity.

URANIAN SOCIETY.

(*Continuation of Mr. W. H. White's Paper "On Comets and their supposed influence on the Atmosphere of the Earth."*)

The orbits of about one hundred comets have been pretty accurately determined; yet it is said that more than five hundred belong to our solar system; and that powerful glasses display multitudes that traverse space beyond the reach of unassisted vision; so that the sun, the centre of our system, may actually be the aphelion of some of them from their native sun. M. Arago has asserted that "more than seven millions of comets frequent the planetary system!"

It is said by some astronomers, that comets rush through our system in every possible direction. An exception must however be made to this broad assertion. Mr. White is not aware that a single comet traverses the line of the celestial ecliptic, in which the earth and other planets travel. Some comets move perpendicularly to the celestial ecliptic, but with almost every degree of obliquity to it; but no comet travels along any portion of it in a direct line; hence, "the unerring minuteness of creative care, in thus guarding the path of the solar worlds from undue proximity even with their generators."

This brings us to the most sublime of all physical contemplations:—*Comets traversing all space, and thus in their celestial missions, and in concert with the Almighty fiat, conveying the sacred influences of one solar system to another, and thus becoming the revivifiers of nature, by developing electricity or magnetism, or some other etherial and regenerating effluvium, containing the vital essence of creative power and wisdom, in such exact proportions, and of such essential properties, as are necessary to produce a generative or recipient medium of life, light, heat, and motion, according to the specific nature and necessary requirements of this, or any other planet, within whose influence the comet may pass in its track. This appears to Mr. White to be the great utility which these monstrous masses of vaporous condensations are appointed to produce in the arcana of nature.*

Mr. White further observes,—We are told by the most celebrated astronomers, that comets travel in elliptic orbits, some of which have great eccentricity, and that these eccentric or elliptical orbits have the sun in one of the foci or centres of the ellipse. It then becomes a rational inquiry, what occupies the other focus of the ellipse? Reason seems to Mr. W. to answer, *another sun, the centre of another solar system.* For if comets move in *elliptical* orbits, having our sun in *one* focus, and nothing in the other, Mr. W. would ask how is the equipoise of the system preserved?

During the time a comet is absent from our system, or removed to a distance beyond the limits of our ken, assisted by the most powerful telescopes, its path must be a mere contingency, unless we suppose a sun, or our sun and a fixed star, which is, no doubt, another sun, to occupy each focus of its elliptical orbit. Unless this, or some similar hypothesis be adopted, we may exclaim, we cannot tell whence they come, nor whither they go!

Now these comctary bodies may be denominated the "veins and arteries of universal vitality," conveying to the most distant portions of space, one common and ever regenerating ether, or vital medium, collected, either from the grand centre of the universe, the repository of vital and restoring energies, or storing themselves with the superabundant effluvium of one system, and distributing it to those that may be deficient.

Thus may comets, those occasional visitants of creative grandeur and magnificence to our system, not only perform the important office of interlacing one solar system with another, but they may be, in the hands of creative intelligence, messengers of life, health, and invigorating influences, bringing to our and to other systems, through which their track may happen to lie, that measure of universal vitality necessary for the stability of organised creation.

The communication was illustrated by a diagram, explanatory of Mr. White's notions of cometary revolution.

ROYAL SOCIETY.

LAST ANNIVERSARY MEETING.

(*Presentation of the Royal Medals, and also of the Copley Medals.*)

The Marquis of Northampton, President, awarded on this occasion the Royal medals to Dr. Martin Barry and Mr. Ivory, and the Copley medal for the year to Mr. Robert Brown, by a unanimous decision of the Council; in so doing, he thus addressed himself to those three gentlemen:—

Dr. BARRY,—It gives me sincere pleasure to bestow this medal on a gentleman who has so well deserved it, by researches in a difficult and impor-

tant portion of animal physiology*. Your merits have been appreciated by men much more capable of understanding the subject, than I can pretend to be, —by men selected by the Council of the Royal Society for their physiological science, who have felt the great value of the discoveries you have made by accurate and diligent research, aided by the skilful use of the microscope. I trust that the award of this medal will encourage you to persevere in the same course, and that future discoveries may add to your reputation and to that of the important profession to which you belong.

Mr. IVORY,—It is not the first time you have been addressed from this chair, and it gives me great satisfaction to follow the steps of my predecessors, Sir Joseph Banks and Sir H. Davy, by again bestowing a medal on one who is an honor to the Royal Society, and pre-eminently distinguished for his mathematical attainments. The labors of your life are too well known to the scientific world to require any eulogium from me, and I consider that in this tribute to your paper on astronomical refraction, we are rather doing an honor to ourselves than to you.

Mr. BROWN,—In conferring the Copley medal on you for your valuable discoveries in vegetable impregnation†, I am quite sure that the voice of scientific Europe will respond to the decision of the Council of the Royal Society. The Académie des Sciences has already pronounced on your merits, as also on those of Mr. Ivory, by electing you as well as that gentleman to a seat among their foreign members; and the University of Oxford has also, by an honorary degree, given you a similar testimonial. That you are one of our fellows is to myself a circumstance peculiarly agreeable, as it must be to the whole body over whom I have the honor to preside. Your discoveries in the particular botanical question for which I have to give you the Copley medal, are so important, not only in a botanical, but also in a general scientific point of view, by showing the close analogies of animal and vegetable life, that the committee of zoology have felt it as much their province as that of the committee of botany to recommend that the Copley medal should be bestowed on you; and the council have come to a unanimous resolution to give it, though at the same time other gentlemen were recommended by other scientific committees, with whom even an unsuccessful rivalry would be no mean praise.

I hope, Mr. Brown, that you may long enjoy life and leisure to pursue researches so valuable to science and so honorable to the country of which you are a native.

The clear annual income of this society according to the report of the treasurer at the last anniversary meeting, which may for some time be expected, without taking into consideration the sums arising from the Fairchild Fund, the Rumford Fund, and the Donation Fund, is about £2,386, or, without the admission fees and compositions, £1,546; and the probable amount of *ordinary* expenses £1,767.

Dr. W. H. Willshire sailed on Thursday week last for Moggadore on his way to the Barbary States and the Atlas Mountains. This botanist intends exploring that part of Africa with a view to investigate and collect the vegetable tribes at the present time so imperfectly understood. We have no doubt from the zeal and enthusiasm of this persevering and indefatigable botanist, that science will derive much benefit from his researches.

* These researches are the subject of Dr. Martin Barry's papers "On Embryology," communicated to the Royal Society in 1838 and 1839.

† The following are the discoveries referred to; viz., the organisation of the vegetable ovale, immediately before fecundation (published in 1826) and the direct action of the pollen, manifested by the contact established between it and that point of the ovulum where the embryo subsequently first becomes visible, and published in papers, in the years 1832 and 1833, and communicated to the Linnæan Society.

THE THEATRES.

"See that the players be well used."—*Hamlet.*

"Nothing extenuate, nor aught set down in malice."—*Othello.*

HER MAJESTY'S THEATRE.—A brilliant and crowded audience assembled on Tuesday night, to witness the representation of *Anna Bolena* for the first time, we believe, this season. Madame GRISI who personified the heroine, was in excellent voice, and sang in the best style.

Mdlle. De VARNY was a very efficient representative of *Jane Seymour*, and Mdlle. E. GRISI sustained the character of *Smeaton*, but hardly invested it with the sprightliness that the part requires. LABLACHE exhibited an exact portraiture of the uxorious eighth Harry, and gave powerful effect to his share of the music.

The *Percy* of RUBINI, was the beau-ideal of that hot-headed nobleman. He sang with great feeling, and was much applauded. The opera did *not* go off with its usual *eclat*. The evening's entertainments concluded with the ballet, *La Brigand de Terracina*, and CERITO, the lovely CERITO, again enchanted the audience by her divine movements.

Thursday evening was appropriated to the benefit of Signor GUERRA. In consequence of the non-arrival of Mdlle. TAGLIONI from Paris, the advertised performance was changed from *Il Barbiere di Seviglia*, to *Anna Bolena*; the principal characters by Mad. GRISI, Mad. BELLINI, Signor RUBINI, Signor MORELLI, and Signor LABLACHE. Between the acts, there was a favorite *pas de deux* by Mdlle. CERITO and Signor GUERRA, which was followed by the ballet of *Le Lac des Fees*. The house was very thinly attended.

PRINCE'S THEATRE.—Nothing extraordinary, or new, has been produced here during the week. On Wednesday, *Iphigenia in Tauris* was repeated, and was received, as heretofore, by the most marked applause. On every repetition, we discover new instrumental beauties in it, and the effective manner in which the *dramatis personæ* sustain their parts, renders the opera pre-eminently attractive. Last evening was performed "by particular desire" (so says Alfred BUNN), WEBER'S opera of *Der Freischutz*, for the benefit of HERR SCHUMANN; and from the company assembled, we should say it proved a benefit indeed. We are assured that the theatre closes this week: *nous verrons.*

DRURY LANE.—The *Concerts d'Etc* are now in the very zenith of their popularity; and the thousands that nightly visit them, give evidence that the English *are* a music-loving people.

The establishment on Thursday night, was filled to overflowing—numbers of individuals having been attracted by the announcement of Lord Burghersh's *Battle of Sinfonia*, which was brilliantly performed, and as rapturously *encored.*

HAYMARKET.—If ever manager deserved well of the public, Mr. WEBSTER is *the* man. It is well known at what high salaries he has retained Charles KEAN and Mr. POWER,—viz., the former at £40 per night, and the latter at £120 per week; besides which, Mr. MACREADY runs away with nearly £100 per week. This, in addition to the other salaries, causes Mr. WEBSTER'S profits to be but small. It always give us real pleasure to see his house well attended, as we are aware *that* is the *only* proof of his being re-paid for his liberality towards the public.

We observe that Charles KEAN has been once more re-engaged for five nights,—being "his 'positively last' appearances before visiting America." His admirers must therefore be quick in their movements, or they will lose their idol without bidding him farewell.

MACREADY is again announced for *Lord Townly, Claude Melnotte*, and *Jacques*, in the ensuing week; and POWER takes his final leave this evening before progressing to Yankee land.

A new play by SERLE, is underlined; and other novelties are in active preparation.

ENGLISH OPERA.—A new mythological extravaganza, entitled *Life in the Clouds*, or *Olympus in an Uproar*, was produced here on Thursday, with complete success.

The plot of such a piece as this, it would be "cruel" to attempt to develop; suffice it to say, it is full of sprees, larks, escapes, adventuros, drinking bouts, affairs of gallantry, &c., &c., the actors in the scene being *Jupiter, Ixion, Juno, Bacchus, &c., &c.*, all of whom enter into the *spirit* of the fun in any thing but *sober* earnest.

We were very much pleased to recognise in the person of *Ixion*, our long lost, and interesting friend, Miss M. GLOVER, daughter of the veteran Mrs. GLOVER, of the Haymarket, the best actress in her line now living. She performed with great spirit, and sang several songs very sweetly; one of them was loudly encored. Miss FORTESCUE, who was "killed by the papers" a few weeks since, "as she was swallowing a glass of negus at supper (while at a friend's house in Camden Town)," enacted the part of *Phaeton.* We have before said, that we cannot praise this young person as an actress, though she may be amiable enough in private life. She is quite unsuited to the stage, and should leave it at the first convenient opportunity. There is not one approach to nature in all her performances. Considering her recent "premature death," we thought she looked surprisingly well. Her lungs, at all events, are in the finest order. BROUGHAM was, as usual, droll particularly. We really hope this establishment is prospering under its new *regime.* There is no lack of novelty.

ASTLEY'S.—The *Siege of Troy* has been produced here in dazzling style; the introduction of the wooden horse, big with humanity, filling all the spectators with rapture and amazement. The *Flitch of Bacon*, illustrating the pilgrimage to Canterbury, was given by Ducrow's noble quadrupeds with the happiest effect. We fancy we shall not err in asserting, that the lady who earned the flitch on this occasion, is the *only* lady on whom that honor has fallen for a long series of years. For a married couple to live in peace and harmony for a twelvemonth-and-a-day, has long since been a matter of pure history. It will always remain so.

SURREY.—We know not how it is, but every thing that the "Governor" undertakes, is successful. This week, he has enraptured the good people of Surrey, by a representation of a piece entitled *Jane of the Hatchet*, well spiced with gunpowder, and redolent of red fire, combats, sieges, skirmishes, and female military exercises,—all so delightful to a Surrey audience. We understand the marshaling of the female warrior *corps* (100 in number!), was under the immediate direction of our friend, W. SMITH, whose energies in the discharge of his martial duties, were apparent in the deportment of his well-organised troops.

The details of the plot, we shall not attempt to unravel. When the curtain fell, the audience were rapturously uproarious.

BRAHAM is engaged as the *prima tenore* for the Birmingham festival. Madame Doras Gras is engaged for both the Hereford and Birmingham festivals; and she is in treaty with the committee to sing at the meeting which is to be held at Hull, early in October.

MRS. STIRLING.—This lovely actress is about to make a provincial tour, having played during the last week at the Queen's Theatre to good houses. Tunbridge Wells is the first place, from whence she will proceed to Brighton, Dover, Stamford, Liverpool, Manchester and Glasgow; at which towns she will go through the whole range of her London charactors, not forgetting that of the *Chairwoman* in the *Ladies' Club.*

HEREFORD MUSICAL FESTIVAL.—The preparations for the approaching musical festival at Hereford, are progressing with great activity. The meeting will take place on the 15th, 16th, and 17th of September, and from the names of the performers already engaged (including Madame Dorus Gras, Lablache, and Miss Birch), and the very praise-

worthy exertions of the stewards, a most brilliant and attractive assemblage of rank and talent may be expected. The meeting will take place under the especial patronage of Her Majesty.

PARIS, JULY 18.—REAPPEARANCE OF MADDLE. TAGLIONI.—Instead of the usual opera, one act only of *Gustave* was given last night, as a prelude to the appearance of Taglioni, and the house, which impatiently heard that act, settled into the most death-like silence as the moment approached for lifting up the curtain and restoring Taglioni to its sight. Every eye was directed to the stage, and as the curtain slowly rose, a general "hush" was heard, to give assurance that no intemperate applause should weaken the first effect. Taglioni was then discovered kneeling at the chair in which the young shepherd sleeps. Taglioni—the *Sylphide*—the same as she appeared so many years ago—was the same light, acrial, graceful being. One warm cheer from boxes, stalls, and pit, announced her presence, and then the stillness was resumed, while she softly rose and glided across the stage, in that gentle elegant movement with which the part commences. This essay showed that Taglioni was still perfection—thunders of applause proved the satisfaction of the house, while she arrested her steps to press her hands to the heart, and to acknowledge, with repeated curtsies, her sense of the public kindness.

From that moment, Taglioni's success was assured, and every scene to the close of the ballet was one of repeated triumph. The *habitues* of the house were in ecstacy, and the public at large mounted to the greatest enthusiasm. Even the most severe critics were subdued, and every one admitted that "she was the only dancer in the world." The lions of the "*avant scene*," the doubles of your dandies of the omnibus box, whose preference of Fanny Elssler was a main cause of the withdrawal of the *Sylphide*, now made ample amends for former unkindness. Their very mustachios trembled with pleasure; and it was more than once apprehended, that some of them would jump out of the box in a paroxysm of delight. Taglioni, evidently much gratified at her reception, danced with all the grace which elevates her so far above other *artistes*, and indulged in occasional feats of strength, to show how easily she might, if it pleased her, exceed those *tours de force* which are the stock in trade of her ungraceful rivals. She bounded across the stage in a single spring, and alighted with as much ease as if she had made no undue exertion. She advanced from the back of the stage with the rapidity of a hird's flight, vanished at one scene, and reappeared at the other wing, as if by magic, and then abandoning all violent display glided into the softest, smoothest measure. The audience repaid these efforts with rapturous applause. She was called back three times in the course of the evening, to receive their welcome marks of approbation, and in the garden scene of the second act, the stage was covered with wreaths and bouquets, thrown from every part of the house.

It was a pretty sight to see this shower of roses falling at her feet, and to observe the crowd of attendant sylphides starting from the recesses of the hovel, and gathering up the flowers as the treasures of their sovereign.

In a part so well known as the *Sylphide*, any particular criticism would be misplaced. It is only necessary to say, that Taglioni never danced better in her life, and that she confirmed the unbought admiration of the most crowded and fashionable house Paris could present at this season. All hands applauded, all voices were in her favor, and even the critics allowed that hers is the only perfect style.

Taglioni is announced for the *Bayadere* on Monday, and for the *Sylphide* again on Weduesday.

OPERA COMIQUE.—The long-promised opera, *L'Opera à la Cour*, has just been produced. The libretto is the joint production of MM. Scribe and St. Georges, and does not add to their established reputation. The music is composed, selected, and arranged by MM. Grisard and A. Bouldieu, and contains some exquisite *morceaux* and *chefs d'œuvres* from well known compositions. Madame Eugenie Garcia made her *entrée* on the occasion, and was received in the most flattering manner. She was ably assisted by M. Masset, M. Challet, and M. Botelli. The latter is a basso cantante of the first order, and his *début* was satisfactory in every sense of the word. He has lately arrived from Milan, where he was an especial favorite, and he will be hailed as one of the greatest acquisitions which this theatre has received for some length of time. The house was full in every part, and the piece went off with success.

BRUSSELS.—The partnership deed of the new managers of the *Grand Theatre* at Brussels, was signed on Wednesday. The privilege of conducting the theatre, is granted to them for only eight months of the present theatrical season, and for the two following.

PUBLIC COMPANIES.

GENERAL SALVAGE COMPANY.

Capital £50,000, *in* 5,000 *shares of* £10 *each; £5 paid.*

The importance of a company like this, is too obvious to require comment; and needs only to be noticed, for its claims on public patronage to be at once acknowledged.

The object of the company, as described in the prospectus, is the recovery of sunken vessels and cargoes, by means of apparatus and modes patented, and which patents are secured to the company.

It struck us on a first consideration, that the proposed capital was on too limited a scale, but it has been pointed out to us, that it will be amply sufficient for all purposes, seeing that every vessel raised, after the apparatus is complete, must add to the funds of the company.

We have seen the models at work, and had their use fully explained to us; and are of opinion that the Salvage Company deserves every encouragement.

ADVERTISEMENTS.

TO IRONMONGERS, LAMP-MAKERS, and CAPITALISTS.—The inventor of a valuable Improvement in LAMPS, wishes to meet with a person who will advance the sum of money necessary to secure a PATENT for his INVENTION, on the principle of a division of the profits and advantages it may realise.

Persons wishing to treat, are requested to apply to Messrs. Delianson Clark and Co., at their Patent Agency Office for all Countries, 39, Chancery Lane, first door in Cursitor Street, London.

JONES'S PROMETHEANS.—The advantages the Prometheans possess over all other instantaneous lights, are their extreme simplicity and durability, as neither time nor climate can impair their original quality. They are composed of a small glass bulb hermetically sealed, containing about a quarter of a drop of Sulphuric Acid, encompassed by a composition of the Chlorate of Potash, enclosed in Wax Papers or Wax Tapers; the latter will burn sufficiently long for sealing two or three letters. The PROMETHEANS being pleasant to use, and never failing in their purpose, are rendered nearly as cheap as the common Lucifers. To be had of all respectable Chemists, &c., or at the Manufactory, 201, Strand.

HOLMES'S PATENT, SEALED NOV. 1839, FOR IMPROVEMENTS IN THE CONSTRUCTION OF IRON SHIPS, BOATS, AND OTHER VESSELS, also in Means for Preventing the same from Foundering, also in the Application of the same Improvements or parts thereof to other vessels.

"All persons who examine this patent, must admit Mr. Holmes to have fully established the principle insisted on in his report to the East India Committee, in 1838, on the indispensable necessity of the adoption, not only of much larger ships than had been contemplated, but that it was equally indispensable, in point of profit, that they should be built of iron, and by the adoption of his improvements a great reduction in the first cost of wear and tear would be effected. Many parts of these improvements are, however, equally applicable to wood ships, as regards safety to the passengers; and wherever they are adopted, we cannot conceive any case or circumstance in which a ship can be placed in danger. In the fullest sense of the word, they become life-boats, without waste of room, or extra cost."—*From the "Inventors' Advocate," July 1.*

Applications for licenses to be made to Mr. HELPS, 21, Cornhill, London, or to Mr. HOLMES, Civil Engineer and Naval Architect, 5, Cannon-row, Westminster.

COLLEGE for CIVIL ENGINEERS.—NOTICE IS HEREBY GIVEN, that the College has been removed from the temporary premises at Kentish Town to very spacious and airy freehold premises at Putney, the purchase of which has been effected by the Council; and that the Students are expected to reassemble on Thursday the 13th day of August next.

By order of the Council,
J. E. B. CURTIS, Secretary.

Every information as to terms, mode of admission, and the general regulations of the College, may be obtained by application to the Secretary, at the Office.

Office, 9, Villiers-street, Strand.
July 22, 1840.

GENERAL SALVAGE COMPANY.—
Capital £50,000, in 5,000 Shares of £10 each, with £5 paid.

DIRECTORS.

Charles Austin, Esq.	Geo. William Lenox Esq.
Charles Bischoff, Esq.	Charles Pearson, Esq.
W. T. S. Daniel, Esq.	Daniel Quarrier, Esq.
Jas. P. Gordon, Esq.	Lestock Peach Wilson, Esq.

BANKERS—Messrs. Prescott, Grote, Ames, and Co.
SOLICITORS—Messrs. Martineau, Malton, and Trollope.
SECRETARY—Mr. William Lee.
Temporary Offices, 14, Bucklersbury.

The chief object of this Company is the recovery of sunken vessels and cargoes, for which purpose certain most important inventions have lately been made and patented, and the exclusive ownership secured to the Company; the principle of these inventions is simple, the efficacy certain, and to secure success, the only thing necessary is to provide for the due application; with this view, experiments upon a most extensive scale have been instituted, under the superintendence of the Directors of this Company, and the result of such experiments has proved the great value of these inventions.

The facts established in the Report of the Committee of the House of Commons, relative to shipwreck, No. 567, page 3, printed 15th August, 1836, sufficiently prove the immense scope for the operations of a Salvage Company, it appearing therein that during a period of six years, to which that Committee limited their investigations, no less than 2,905 vessels were wrecked or missing; and the amount of losses thereby, was estimated at £14,515,000: and it will be recollected that in the month of January, 1839, nine vessels were stranded in the entrances to the Mersey alone, the value of whose cargoes exceeded £1,000,000.

The Directors have satisfactory proof, that much of the property referred to by the Committee of the House of Commons rests under circumstances favorable for its recovery, being specie, metals, and other imperishable goods, to which the means at the disposal of the Company are certainly applicable, and the continual addition to this accumulation by the disasters daily reported from the coast, leaves no room for doubt that the operations of the Company will prove as extensively beneficial as they are important.

Prospectuses and further information, may be had at the temporary offices of the Company, 14, Bucklersbury, where working models of their apparatus may be seen.

Applications for shares must be made, addressed to the secretary as above, prior to the 1st of August next.

Mining Journal Office, 37, New Broad-street, City, 27th June, 1840.

NEW WORK ON THE IRON TRADE.—The Number of the MINING REVIEW this day published, contains the Sixth Part of the Paper on the IRON TRADE, by Harry Scrivenor, Esq.—this work will be completed in Twelve Monthly Parts, and so arranged as to form a separate volume at the end of the year; in addition to which the MINING REVIEW contains—A Paper on the Establishment of a School of Mines—On the Ventilation of Mines, by Samuel Moyle, Esq., C.E.—On the Preparation of China-Clay, by W. J. Henwood, Esq., F.R.S., &c.—On Blasting Limestone Rock, being an Account of Blasting the White Limestone in the Country of Antrim, Ireland, by William Bald, F.R.S.E., M.R.I.A.—On the Applicability of Peat to Manufacturing Iron—Parliamentary Returns of the Imports and Exports of Copper, Lead, and Tin, for the year ending 5th January, 1840—Scientific Bodies, &c.—The MINING REVIEW is published at the office, as above, on the 1st of each month, price Sixpence.

The MINING REVIEW is also furnished, to subscribers, as a Monthly

GRATUITOUS SUPPLEMENT TO
THE MINING JOURNAL,
RAILWAY AND COMMERCIAL GAZETTE,
Forming a complete Record of the Proceedings of all Public Companies.

The "MINING JOURNAL" is the only newspaper exclusively devoted to Geology, Mineralogy, and Metallurgy; combining therewith reports of the proceedings of all public companies, correspondence from the English and Foreign mining districts, sales and purchases of ores, prices of metals and materials, prices of English and Foreign funds, shares in mines, railways, joint-stock banks, canals, &c., with parliamentary summary, London Gazette, and much original and interesting scientific intelligence, &c.; forming an invaluable record of every occurrence relating to mines, railways, joint-stock banks, &c.

The "MINING JOURNAL" is published at two o'clock every Saturday afternoon, at the office, 37, New Broad-street, City, to which address all Advertisements and Communications are requested to be addressed. Price 6d., and may be had of all booksellers and newsvendors in town and country.

RAILWAY MAGAZINE, AND COMMERCIAL JOURNAL. Railways, Banks, Mines, Steam Navigations, Assurances, Public Works, &c.—This long-established and extensively-circulated Work, which has attained the greatest celebrity for the value of its Articles, and its uniform success in all causes it has advocated, is now published WEEKLY, price 4½d. stamped, and consisting of 16 closely and handsomely printed pages. It contains full and accurate Reports of all Railway and other Joint-stock Company Meetings; Steam Navigation; Asphalte; Accounts of New Companies, Banks, Mines, Assurances, Canals, Docks; a most important table to all travellers of the times and fares of all Railway Trains throughout the kingdom; unique and valuable tables of the prices of Railway and other Shares, Paper Money in circulation, Metals, Traffic of Railways, Meetings, Calls and Dividends, General, Mechanical, and Scientific Intelligence. A Tide Table for every day in the Week for each Port frequented by Steam Vessels.

Orders received by all News Agents, and at the Office, 3, Red-Lion-court, Fleet-street, London; Messrs. Arnold, Liverpool; Mansell, Birmingham, &c.

PATENT ROLLING and COMPRESSING IRON COMPANY, 78, King William-street, city. Capital £125,000, in 5 000 shares of £25 each. Deposit £5 per share.

DIRECTORS.

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Sir William Gosset, Royal Engineers.	William Ryton, Esq.
	W. H. Vardy, Esq.

Bankers—Messrs. Glyn, Halifax, Mills, and Co.

Solicitor—Thomas Hanson Peile, Esq. Great Winchester Street.

Secretary—Mr. John Atlee.

The object of the Company is the working of certain patents obtained and now in force for rolling and compressing iron by machinery, thus producing in an immeasurably shorter time, and at a greatly diminished cost, a variety of articles proved to be very superior to those resulting from manual labor.

The articles to which these patents apply, consist of bolts, rivets, railway pins, and others too numerous to particularise, of which the consumption is unlimited, and which are indispensable in the construction of railways, steam boilers, gasometers, ship building, architectural, and a variety of other very useful purposes,

The patent railway pins have for some time past been used on the railroads throughout England, and their superiority is established not merely by the certificates of some of the first engineers, but practically by the repeated orders of contractors and American agents, (some executed and others in course of execution,) the whole of which may be seen on application to the Secretary, who will show specimens of the article produced, and afford any further information relative to the undertaking generally.

Application for shares to be made to the Secretary, at the Company's offices.

TO ENGINEERS, ARCHITECTS, CLERKS OF WORKS, BUILDERS, AND ALL PRACTICAL MEN.

NOW PUBLISHING, in MONTHLY PARTS, EACH COMPLETE IN ITSELF, that sterling practical work—The ARCHITECTURAL PRECEDENTS, containing Plans, Sections, Elevations and Details, Specifications, Estimates, Bill of Quantities, Prices, and Practical Notes; Edited by an Architect.—The First Part contains Second-rate Buildings; the 2d contains St. Olave's School, Southwark, John Newman, Esq., Architect; the 3rd and 4th, Spilsby Gaol Sessions House, H. E. Kendall, Esq., Architect. This work has been received with the most distinguished success—some of the finest buildings in England.

Published by John Williams, 106, Great Russell Street.

THE SHIPPING AND MERCANTILE GAZETTE, London Evening Journal of Maritime, Commercial, and Political News,—combining all the essentials of a Daily Newspaper, with the prominent features of complete and exclusive intelligence on every subject connected with the Shipping and Trade of the United Kingdom. The Shipping Gazette has obtained a character for correctness and usefulness unprecedented in the annals of Newspapers. It now commands an extensive circulation throughout the United Kingdom and the Colonies, on the Continent of Europe, in the United States of America, and other foreign countries; and is therefore a most eligible medium for commercial and miscellaneous advertisements, particularly those that relate to the sale, charter, freight, equipment, and sailing of vessels, and the sale of merchandise, and that have for their object the particular attention of Merchants, Ship-Owners, and Mariners, and those having dealings with them. The establishment of the Shipping Gazette forms a new era in the history of Shipping Intelligence; comprising, as it does, daily and complete announcements of the arrival and sailing of all vessels, in the coasting and foreign trades, together with an accurate account of vessels spoken at sea; state of winds and weather; accidents; losses; rates of foreign and coasting freights; premiums of insurance; wholesale prices of goods; stock-exchange news; coal, corn, and other markets; which information is regularly furnished and derived from the most authentic sources at home and in foreign countries trading with Great Britain. The Shipping Gazette further embraces a comprehensive detail of domestic and miscellaneous intelligence; records of all important events; reports of parliamentary proceedings, public meetings, decisions of law and police courts, &c., especially such as refer to nautical and commercial matters; and altogether contains a larger mass of information than is afforded by any other Evening Newspaper. The Shipping Gazette is frequently referred to by witnesses examined before Committees of the House of Commons, as furnishing the most authentic evidence on maritime affairs. Orders, communications, and advertisements for the Shipping and Mercantile Gazette, are received by its Agents at the respective out-ports, and by any News Agent in town or country. Advertisements and communications to the Editor, may be sent to the Publication Office, No. 54, Gracechurch Street, London.

THE FACILE DIVESTER CORSET, J. P. WESTHEAD, Patentee.—This elegant Invention is a decided improvement in the apparel of Ladies; it is highly conducive to comfort, and is remarkable for simplicity and durability. All Corset-makers who wish to obtain licenses to apply this improvement, may address the Patentee, at Messrs. Wood and Westhead's, 49, Piccadilly, Manchester.

IMPORTANT IMPROVEMENT IN CORSETS.

AGENTS WANTED.—WANTED, ACTIVE AGENTS at the West and East Ends of the Town, for the immediate introduction of Westhead's Facile Divester Corset, [whereby relief may be given to persons suffering from tight lacing in a single moment, by means of an invisible communication. The above is likely to become a very profitable agency.

Applications, pre-paid, to be addressed to the Inventor, J. P. Westhead, at Messrs. Wood, and Westhead's, 49, Piccadilly, Manchester.

THE IMPERIAL WOOD PAVING COMPANY.

CAPITAL, £30,000.—In 3,000 SHARES of £10 EACH

DEPOSIT £2 a SHARE.

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Sir W. P. Call and Co.

Solicitor and Secretary.
Mr. S. M. Cooper.

The great success which has attended the introduction of Wood Pavement, its superior cleanliness, freedom from noise, and saving in the wear of carriages, has induced talented persons to direct their attention to the best mode of its execution.

This company has been formed, with a view of working in the metropolis and its environs, a patent obtained for a principle, whereby the blocks fasten each other by equal angular pressure and form a dove-tail each way.

By this method, all danger from slipperiness, and displacement of the blocks by sudden jerks, and the expense of pegging the blocks together, is avoided, and they are easily removed in case the gas or water pipes are out of order.

The Paving, including foundation of concrete or fine gravel, with ballast or bitumen, can be laid down at a cost price of full 30 per cent. less than any other Patent offering the same advantages.

The model has been submitted to the Right Honorable the Commissioners of Her Majesty's Woods and Forests, who have testified their approbation of it.

Applications for shares, to be addressed to Mr. S. M. Cooper, 9, Old Cavendish-street, Cavendish-square, where Prospectuses may be obtained, and a model of the plan seen.

TO INVENTORS AND PATENTEES.

DELIANSON CLARK AND CO.,

PROPRIETORS OF

THE INVENTORS' ADVOCATE, AND JOURNAL OF INDUSTRY;

BEG LEAVE TO INFORM THE PUBLIC, THAT AT THEIR

PATENT AGENCY OFFICE, 39, CHANCERY LANE,

They attend to EVERY BRANCH of BUSINESS CONNECTED with PATENTS and INVENTIONS,—not ONLY IN THE UNITED KINGDOM, but IN ALL the COUNTRIES of EUROPE, and in the UNITED STATES.

The ARRANGEMENTS THEY HAVE MADE are EXTENSIVE and COMPLETE,—no EXPENSE being SPARED TO ENABLE THEM to do justice to their clients. In every department of their business they are assisted by professional and scientific men, well versed in the technicalities and practice of the Patent Law, and well-informed on all matters of Science, Arts, and Manufactures, and more especially Mechanics and Chemistry. They likewise have on their Establishment able Engineers and Draughtsmen to take surveys and elevations, draw plans, &c.

In order to give effect to their extensive Plans for Promoting the Interests of Patentees and Inventors, DELIANSON CLARK and Co., besides their

LONDON OFFICE, 39, Chancery Lane,

HAVE ESTABLISHED OFFICES AT

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The HAGUE, for HOLLAND; BERLIN, for PRUSSIA; VIENNA, for the AUSTRIAN DOMINIONS; MUNICH, for BAVARIA; DRESDEN, for SAXONY; FRANKFORT, for the GERMAN UNION; ST. PETERSBURGH, for RUSSIA, &c. &c. &c.

N.B. A Solicitor is in attendance, daily, from Eleven till Two o'Clock, who may be consulted on all points of PATENT LAW.

London: Printed by JOHN EAMES, 7, Tavistock-street, in the parish of St. Paul, Covent Garden, in the City of Westminster; and Published for the Proprietors, by WILLIAM KIDD, at the Office, 7, Tavistock-street, Covent Garden, (as aforesaid) to whom Books, &c. for Review, (addressed to the Editor), should be forwarded. Saturday, July 25th, 1840.

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INVENTORS' ADVOCATE,

AND JOURNAL OF INDUSTRY;

A WEEKLY BRITISH AND FOREIGN MISCELLANY OF

INVENTIONS, TRADE, MANUFACTURES, LITERATURE, AND THE ARTS.

PRINTED BY JOHN EAMES, 7, TAVISTOCK STREET, COVENT GARDEN.

No. 53.] SATURDAY, AUGUST 1, 1840. [PRICE FIVEPENCE STAMPED. CIRCULATING FREE BY POST.

STATE OF CRIME IN 1839.

The following are the leading outlines of returns presented to both Houses of Parliament, by command of Her Majesty, entitled "Criminal Tables for England and Wales, 1839:"—

"The Criminal Tables for 1839 show a considerable *increase* in the number of persons committed for trial in that years; the decrease of 2·2 per cent., in 1838, having been followed by an increase amounting to 5·8 per cent., a result which for many years has succeeded any temporary check in the continuous increase of the number of committals. The increase is spread over 25 English, and 9 Welsh counties, and amounts to 2,027 persons, or 12·5 per cent.; while the decrease extends only to 14 English, and three Welsh counties, and amounts to 671 persous, or 11·1 per cent.. leaving the net increase 1,356 persons.

"The following calculation will show the proportionate increase or decrease in each of the classes of crime, during the three last years.

	1837.	1838.	1839.
1st Class, Offences against the person	12·1 dec.	8·1 inc.	8·1 inc.
2d ..... Offences against property, committed with violence	6·8 inc.	9·1 inc.	6 9 dec.
3d ..... Offences against property, committed without violence	16·8 inc.	3·3 dec.	5·3 inc.
4th..... Malicious offences against property	32·1 dec.	21·9 dec.	17·9 inc.
5th..... Forgery, and offences against the currency	27 inc.	10·3 inc.	13·3 dec.
6th..... Other offences, not included in the above classes	1 inc.	20·4 dec.	47·3 inc.

"The principal iucrease in the last year, in the 1st class, has fallen chiefly on the lighter offences of assaults, and assaults on peace officers. There is an increase in the attempts to murder; but murder itself, and manslaughter, have decreased. In the 2d class, burglary, house, shop, and counting-house breaking, have decreased; robbery has slightly increased. In the 3d class, which includes nearly four-fifths of the whole number of commitments, all those offences of most frequent commission have increased—such as larceny, larceny in dwelling-houses, from the person, and by servants (which latter offence has increased 20 per cent. last year, and has been progressively increasing for several years); embezzlement, fraud, and receiving stolen goods; horse, sheep, and cattle stealing have decreased. In the 4th class, the increase has been general, though, compared with the preceding five years, the numbers are far below the average. The 5th class shows a decrease, which has been very marked, in coining, and having in possession coining implements; while, at the same time, the increase for uttering forged Bank of Eugland notes has been equally remarkable, though the commitments for these offences are so few, that the proportion is doubled by the addition of two or three offenders. The 6th class has considerably increased, and this may, in a great measure, be attributed to the political offeuces connected with chartism, which are placed in this class under the head riot, sedition, &c. But the chartist offences, for trial at the Monmouth Special Commission, and many other prosecutions of this description, do not find a place in these tables. They will be inserted in the tables for 1840, in which year they remained for trial.

"The great amelioratiou of the crimiual code, which was effected by the acts of the 1st Victoria, is more clearly exhibited by the tables of 1839 than by the tables of the preceding year, those acts having come more generally into operation. The capital convictions amount to 54 only, a number considerably less than the average of executions teu years previously.

"The acts of the 1st Victoria have also had a very beneficial effect upon the result of prosecutions; juries being in all cases less unwilling to convict when they know that capital punishment will not follow.

"Though there has been, for many years, a great progressive increase in the number of commitments and convictions, the increase in the numbers sentenced to tranportatiou has been beyond all proportion to the general increase. This great increase in the number of trausports immediately followed the Act of the 7 and 8 Geo. IV., c. 28, and arose out of an enactment in that statute, augmenting the punishment to which prisoners were liable on the proof of a previous conviction for felony. The greater severity in the punishments, which was consequent upon this enactment, is at once obvious, on a reference to the numbers sentenced. The act was passed in 1827; the average numbers sentenced to transportatiou, iu the three preceding and the three following years, were as follows:—

	Average of 1824-5-6.	Average of 1828-9-30.
Numbers sentenced to transportation for life	125	373
Ditto ditto for 14 years	140	619
Ditto ditto for all periods	1,884	3,168

"This sudden increase was maintained in the succeeding years, and gradually progressed with the general increase of commitments, so that the average of the last six years amounts to 3,746. The acts of the 1st Victoria, have, however, tended to reduce the frequency and the severity of this sentence. The numbers sentenced to transportation, or whose sentences were commuted to that punishment, which on the four years preceding those acts averaged 4,154 annually, were, in the last year, 3,699 only, and the severity of the periods of transportation were at the same time reduced in a much greater degree.

"The calculations which have for several years been made as to the *ages* and *degrees of instruction* of criminals exhibit a very great uniformity of result. During the last four years nearly 41 per cent. of the criminals do not exceed 21 years of age, and in the next division of the tables, those not exceeding 30 years included 71 per cent. This would give criminals but a short career, and may in a great measure be attributed to the numbers annually removed from the country by transportation.

DEGREE OF INSTRUCTION.	1839	1838	1837	1836
Unable to read and write	33·53	34·40	35·85	33·52
Able to read and write imperfectly	53·48	53.41	52·08	52·33
Able to read and write well	10·07	9·77	9·46	10·56
Instruction superior to reading and writing well	0·32	0·34	0·43	0·91
Instruction could not be ascertained	2·60	2·08	2·18	2·68

"With respect to the sexes of criminals, it is worthy of remark that for several years *the proportion of females* has been INCREASING. Comparing the number of males and females, the centesimal proportion of the latter was, in 1834, 18·8; in 1835, 20·0; in 1836 and 1837 it was the same, 21·6 (though the fraction, if carried further, still shows a small increase in 1837); in 1838, 22·1; and in 1839, 23·2.

"Home Office, Whitehall, June 11, 1840."

THE EMPLOYMENT OF CHILDREN IN FRENCH MANUFACTORIES.

The following circular relative to the proposed law for regulating the employment of children in manufactories, has been sent by the French minister of agriculture and commerce to the Chambers of commerce and manufactures in the different departments of France:—

"Gentlemen—You are aware that the attention of the government, roused by numerous complaints,

has been directed to the important question of the labor of children in factories. By a circular from my department, dated the 31st July, 1837, you were consulted respecting the extent of the evil; the general councils of agriculture and commerce were invited to consider the subject, and to propose means for remedying it. At length, a project of law prepared by the government was submitted to the Chamber of Peers, discussed, and amended. Unfortunately, the advanced period of the session did not permit the Chamber of Deputies fully to consider the project; but the report of the commission of the Chamber shows the firm determination of that branch of the legislature to concur in suppressing an abuse that is an outrage on humanity, and which, by threatening to enervate the physical strength of the country, might ultimately destroy its power.

"In this position of affairs, the government has three projects before it; the one proposed by itself, that of the Chamber of Peers, and that of the Chamber of Deputies; all of which agree in the end to be attained, but differ materially as to the means of accomplishing it.

"The government was in the first instance of opinion that, considering the diversity of manufactures, and the difference of climate, it would not be advisable to impose a fixed and invariable regulation for all parts of the country; and that it would be better to invest the government with the power of fixing the rules to be observed, so as to adapt them to the necessities of each manufacture, and to the wants of each locality. The Chamber of Peers thought otherwise; they conceived that a mere discretionary power would not be sufficiently strong to be seriously obeyed; and that a diversity of regulations would produce grievous inequalities of condition in manufactures, and that it would be requisite to proceed in the matter by fixed legislative acts, of general operation throughout the kingdom. The Chamber of Deputies have also taken this view of the subject; and the government has no objection to adopt it.

"Some other differences of opinion were expressed during the discussion, referring principally to the description of manufactories to be subjected to the law; to the observance of Sundays and fast days; to the obligation of attending schools; to penalties, &c. I beg you will attentively examine the proposed arrangements in all their bearings. The government, anxious to be informed of the best means of obtaining the desired end, will receive your observations with the interest they deserve.

"There is one point to which I particularly wish to direct your attention; viz., the arrangements that will be requisite to carry such a law into effect. The government had reserved to itself the right of appointing one or more inspectors in every department. The Chamber of Peers were of opinion, that the duty of inspection should be delegated to the prefects, or sub-prefects, or to the mayors. The Commission of the Chamber of Deputies proposed to restore the system of appointing special inspectors, making the appointment of them compulsory, instead of leaving it to the option of the government.

"It must be admitted that the organisation of an effective system of inspection is an essential part of the law; and in that perhaps consists its difficulty. The commission of the Chamber of Deputies was aware of it, and was content to lay down the principle, leaving to the government the choice of the manner, the form, and the nomination of the inspectors. I desire that, from the practical point of view in which you are placed, you will well examine the means by which the principle may be applied. You, as well as the government, must desire to witness the complete execution of the law—it is essential to the honor of the country and to the welfare of our manufactures. I depend therefore upon your assistance; and I expect that the communications I now solicit from your experienced and intelligent body will prove useful in the final discussions which must precede the adoption of legislative measures. The settlement of the question will take place in the approaching session of the Chambers."

CANALS IN AMERICA.

A work has recently been published by M. Michel Chevalier, full of statistical details relative to the manufactures and trade of North America. In this work, great attention has been paid to the accuracy of his figures; and the values being all reduced to one standard, it will be a useful work of reference to the Americans themselves. His attention has been particularly directed to the internal means of communication, and he frequently adduces facts to prove that increase of trade and prosperity depends on the increased facilities of communication. As one instance among others, cited by M. Chevalier, of the advantage attending the opening of fresh means of cheap intercourse, he gives the following statement of the increase of public wealth in the state of New York before and after the opening of the canal to Lake Erie.

	Amount of the Public Wealth in the State of New York.	In the Town of New York.
	BEFORE THE OPENING.	
1815	1,500,027,000fr.	453,392,000fr.
1820	1,362,946,000	370,831,000
1825	1,404,946,000	539,420,000
	AFTER THE OPENING.	
1826	1,490,092,000	573,055,000
1828	1,838,116,000	608,104,000
1830	1,701,964,000	668,205,000
1832	1,976,288,000	780,284,000
1834	2,487,776,000	994,925,000
1835	2,819,074,000	1,166,526,000

"More than half the increase of wealth," observes M. Chevalier, "that the state of New York has acquired by the multiplication of canals, has been effected by the development of commerce in the town of New York. Thus the opening of the great canal to Lake Erie has produced in the commercial metropolis of the valley of the Hudson, the formation of capitals that have fructified not only in the whole state, but in the most distant parts of the union; a striking proof of this principle, that one of the surest means of enriching a country is to connect the interior districts with the ports whence the national produce is exported, and to which the produce of foreign countries is brought."

A LIST OF PATENTS SEALED

FROM JUNE 26TH TO JULY 29TH, 1840.

(*Continued from* Vol. II. *p.* 403.)

ENGLAND.

JOHN WILLIAM NYREN, of Bromley, manufacturing chemist, for *improvements in the manufacture of oxalic acid.*—6 months, June 26.

THOMAS SPENCER, of Manchester, machine-maker, for *a certain improvement or improvements in twisting machinery, used for roving, spinning, and doubling cotton, wool, silk, flax, and other fibrous materials.*—6 months, June 26.

WILLIAM JEFFERIES, of Holme-street, Mile-end, metal refiner, for *improvements in obtaining copper spelter, and other metals from ores.*—6 months, July 1.

WILLAM M'MURRAY, of Kenteith-mill, Edinburgh, paper-maker, for *certain improvements in the manufacture of paper.*—6 months, July 1.

JOHN DAVID POOLE, of Holborn, practical chemist, for *improvements in evaporating and distilling water and other fluids.*—6 months, being a communication, July 2.

CHARLES MAY, of Ipswich, engineer, for *improvements in machinery for cutting and preparing straw, hay, and other vegetable matters.*—6 months, July 6.

EDWIN TURNER, of Leeds, engineer, for *certain improvements applicable to locomotive and other steam-engines.*—6 months, July 6.

JAMES HARVEY, of Bazing-place, Waterloo-road, gent., for *improvements in extracting sulphur from pyrites and other substances containing the same.*—6 months, July 8.

LOUIS LECONTE, of Leicester-square, gent., for *improvements in constructing fire-proof buildings.*—6 months, July 9.

JOSHUA TAYLOR BEALE, of East Greenwich, engineer, for *certain improvements in steam-engines.*—6 months, July 10.

GEOROE BARNETT, of Jewin-street, London, tailor, for *improvements in fastenings for wearing apparel.*—6 months, July 11.

JOSEPH GETTEN, of Paul's-chain, London, merchant, for *improvements in preparing and purifying whale oil.*—6 months, being a communication, July 11.

WILLIAM PALMER, of Feltwell, Norfolk, blacksmith, for *certain improvements in ploughs.*—6 mths., July 11.

PETER FAIRBAIRN, of Leeds, engineer, for *certain improvements in machinery or apparatus for heckling, combing, preparing, or dressing hemp, flax, and such other textile or fibrous materials.*—6 months, being a communication, July 13.

THOMAS TASSELL GRANT, Esq., an officer in Her Majesty's victualling yard at Gosport, for *improvements in the manufacture of fuel.*—6 months, July 13.

EDWIN TRAVIS, of Shaw-mills, near Oldham, Lancaster, cotton-spinner, for *certain improvements in machinery, or apparatus for preparing cotton and other fibrous materials for spinning.*—6 months, July 15.

JOHN LAMBERT, of Coventry-street, St. James's, within the Liberty of Westminster, gent., for *certain improvements in the manufacture of soap.*—6 months, being a communication, July 15.

JAMES JAMIESON CORDES, and EDWARD LOCHE, of Newport, in the county of Monmouth, for *a new rotary engine.*—6 months. July 18.

MOSES POOLE, of Lincoln's-inn, gent., for *improvements in fire-arms, and in apparatus to be used therewith.*—6 months, being a communication, July 18.

JAMES ROBERTS, of Brewer-street, Somers-town, ironmonger, for *improved machinery or apparatus, to be applied to the windows of houses or other buildings, for the purpose of preventing accidents to persons employed in cleaning or repairing the same; and also for facilitating the escape of persons from houses when on fire.*—6 months, July 18.

FRANCIS TODD, of Pindinnia Castle, Falmouth, gent., for *improvements in obtaining silver from ores and other matters containing it.*—6 months, being a communication, July 27.

ROBERT IRWIN, of Durham, engineer, for *improvements in steam-engines.*—6 months, July 29.

JOHN SWAIN WORTH, of Manchester, merchant, for *improvements in machinery for cutting vegetable substances.*—6 months, being a communication, July 29.

ALEXANDER ANGUS CROLL, superintendant of the Chartered Gas Company's Works, Brick-lane, for *certain improvements in the manufacture of gas for the purpose of illumination, and for the preparation or manufacture of materials to be used in the*

purification of gas for the purpose of illumination.—6 months, July 29.

A Grant unto JOHN GEORGE BODMER, of Manchester, civil engineer, of an extension for the term of seven years, of letters patent granted to him, for *certain improvements in the machinery for cleaning, cording, drawing, roving, and spinning of cotton and wool.*—July 29.

JOSEPH BENNETT, of Turnlee, near Glossop, Derby, cotton-spinner and paper-maker, for *certain improvements in machines for cutting rags, ropes, waste hay, straw, or other soft or fibrous substances, usually subject to the operation of cutting or chopping, parts of which improvements are applicable to the tearing, pulling in pieces, or opening of rags, ropes, or other tough materials.*—6 months, July 29.

EXPIRED PATENTS.

PATENTS THAT HAVE EXPIRED DURING THE WEEK ENDING JULY 25, 1840.

ENGLAND.

JAMES BARRON, of Birmingham, in the county of Warwick, brassfounder and Venetian blind-maker, for *his invention of a combination of machinery or apparatus for feeding fire with fuel, which machinery or apparatus is applicable to other purposes*, July 24.

WILLIAM JOHNSTON, of Caroline-street, Bedford-square, in the county of Middlesex, jeweller, for *his invention of certain improvements on ink-holders, which he conceives will be of public utility*, July 24.

WILLIAM ROBINSON, of Craven-street, Strand, in the county of Middlesex, Esq., for *his having invented, or found out, a new method of propelling vessels by steam on canals or navigable rivers by means of a moveable apparatus attached to the stem or stern of the vessel*, July 24.

WILLIAM PARSONS, of the Royal Dock-yard, Portsmouth, naval architect, for *his having invented certain improvements in building ships or vessels, which improvements are calculated to lessen the dangerous effects of internal or external violence*, July 24.

SPECIFICATIONS.

A LIST OF SPECIFICATIONS ENTERED AT THE ENROLLMENT OFFICE, UP TO THE WEEK ENDING JULY 25, 1840.

(Continued from page 51.)

ENGLAND.

SAMUEL BROWN, 8, Finsbury-pavement, City of London, engineer, *improvements in making casks and other vessels of or from iron and other metals*, July 21.—First improvement is the mode of applying and fixing heads or ends, to iron or other metal casks or vessels. The metal head has a turned up edge, which is secured to the cask or vessel by turning down the rim, so as to fit over the edge of the metal head.

2. The mode of constructing a machine for cutting sheets of metal for making casks or other vessels, by parallel rails and a moveable gauge plate.

3. The mode of combining the parts connected therewith into a machine for turning over the edges of sheets of iron, or other metal, for making casks or vessels. The iron plates being first cut by the parallel gauge, the ends requiring to be turned are placed on the table that has a gauge plate to direct the metal to a parallel curve, to form ears or projections, while the presser of the machine forces it round.

4. The mode of forming dies, one having a plain cutting edge, and the other an undulating cutting edge for cutting circular plates, whereby is obtained an economy in labor, as the undulating cutting die operates with greater facility on the metal plate.

5. The mode of constructing dies for sinking the heads or ends of casks, and thereby obtain a circular upright edge, which is fitted to the barrel of the cask or vessel. The plate being arranged over a hollow die, the following or pressing die forces down the plate in the hollow die so as to allow the edges to rise. A ram or piston working in a hole at the bottom of the hollow die, force each formed head out of its mould.

6. The mode of bending and punching the ends of handles belonging to the heads of casks, by dies and pressure.

7. The mode of combining the mechanical parts of a machine for punching the holes for rivets, through the ends of the cylinders and the turned up edges of the heads.

The lever working on a hinge, has a projection or curve on one side, which holds the punch; a die is placed on the bed or table, and as the end of the cylinder passes over the die, the lever in working up and down punches the hole in the metal.

8. The mode of combining the mechanical parts of a machine, for punching and cutting off proper lengths of plates. The punch is merely formed with a cutting edge on one side, whereby the lengths of plate are cut off with the same action that punches the hole.

SAMUEL WILKES, of Darleston, Staffordshire, iron-founder, *improvements in the manufacture of hinges*, July 21.—This improvement is for casting the two flaps or sides with their hinge joints, at one time, on to a suitable axis.

Small circular discs to fit between the joints are arranged on the axis or pin, which is varnished and dusted over with fine burnt clay to prevent the molten metal adhering to the pin and discs.

A model hinge forms the mould, and the pin with the discs must be placed in the centre or proper position; then iron filling, or what are termed "chills," being placed round the pin to form the joints, the molten iron is poured into the mould, which produces the casting of a hinge perfect, and moving freely on the pin or axis.

JAMES HALL, of Glasgow, upholsterer, *improvements in beds, mattrasses, and apparatus applicable to bedsteads, couches, and chairs*, July 21.—The inventor, in the spirit of philanthropy, says, he shall be happy to hear of any improvement on his invention, which has been patented for the benefit of mankind.

First improvement is for arranging the bed or mattrass with air bags, so as to prevent the feathers collecting in a body, and to avoid the necessity of disturbing the patient by making his bed.

Second improvement is for fixing a pan in the mattrass or bed, and in connection with a receiver under the bed, so that the patient may be seated in his bed, by the assistance of a frame with arms.

This pan will answer all the purposes of a bidet, as a stopper is fitted at the bottom to convey the water off when requisite, while a cock will admit water from the pipe of a small cistern.

GEORGE WILSON, St. Martin's-court, St. Martin's-lane, *an improved paper-cutting machine*, July 21.—This improvement consists in the use of a long strait chisel-edged knife or blade, fixed in a sliding frame, and forced by machinery through the paper to be cut, a motion being given to the same blade either in a vertical direction, or in one vertical and the other sideways, which may be obtained by applying the pressure in an oblique direction.

An upright screw presses the follower on to the paper that is placed on the table. A frame holding the chisel edge knife, is forced by means of a fly wheel and screw that is placed obliquely, which action causes the frame with its blade to descend vertically with a slanting or forward motion at the same time.

ARTHUR HOWE HOLDSWORTH, Brookill, Devonshire, *improvements in preserving wood from decay*, July 21.—The object of this invention is to preserve wood or timber from decay by immersing it in certain liquids, having the properties of receiving a temperature capable of charring or searing the surface of wood that has been exposed to their action, and of concreting or hardening more or less by subsequent cooling, so as to remain in those pores into which they have previously entered, as well as to cover the surface of the wood, and thus prevent it from the injurious effects of air and moisture.

The liquid employed is composed of tar, pitch, resin, or tallow, or that of its products, where it has been subsequently inspissated. This liquid which can be brought to a higher degree of temperature than water, is placed into a suitable receiver, into which the wood is immersed, and allowed to remain until all bubbling ceases, occasioned by the air passing from the wood.

When the wood is required for flexible purposes, such as the decks of vessels, &c., then it is only allowed to remain in the liquid while at a temperature ranging from 212 to 120—but for charring or searing the wood, the liquid must be brought to boiling point.

The receiver has a cover with ascending pipes, to take off the inflammable vapor rising from the tallow, tar, pitch, or resin.

When the wood is removed from the liquid, it must be dried in suitable ovens.

WILLIAM STONE, of Winsley, Bradford, Wiltshire, *improvements in the manufacture of wine*, July 21.—The claim for this improvement in making wine, is the application of the product from the stems or stalks of the plant called rhubarb.

In the month of May when rhubarb is green, the stalks of the leaves are used as in the following proportions; five pounds of stalks are bruised in a suitable vessel, to which is added one gallon of cold spring water; and after remaining in mash three or four days, the liquor or juice is poured off; when, to every gallon of this juice, three pounds of loaf sugar are added and allowed to ferment for four or five days, in a suitable vat; as soon as the fermentation has ceased, the liquor must be drawn off into a cask and allowed to remain until the month of March, when all fermentation will have finished, it must then be racked off, and more lump sugar must be added.

In the month of August, a second crop of rhubarb will be ready to gather for this improved method of making wine—British Champagne.

JULES ALPHONSE SIMON DE GOURNAY, of Bread-street, London, *improvements in the manufacture of horse-shoes*, July 22.—This patent horse-shoe is admirably adapted to the purpose of travelling, when horses are apt to lose their shoes, or for race horses that frequently require their shoes to be taken off, as well as for horses that have diseased hoofs.

The shoe has at the fore part a clip or crotchet, which comes over the hoof; nearly at each end of the branches of the shoe are ears or rising studs; and between this and the front clip are two angular studs, (called in French "talus") which enter the hoof of the horse; a band or bridle made of metal or leather passes from the ears or rising studs, and holds on to the front clip, whereby the shoe is secured on the hoof. In cases of diseased hoof, the front clip or crotchet is made to move on a hinge, and the band or bridle is tightened as required, by a nut and screw.

JOSEPH ROCK COOPER, Birmingham, Warwick, gun-maker, *improvements in fire-arms, and in the balls to be used therewith*, July 21.—The first claim is for the mode of carrying the axis of the tumbler by the bridles, formed on the trigger plate, and retained therein by the main spring. The construction of this lock is very simple, and merely consists of four pieces.

Second claim is the mode of constructing fire-

arms, with an opening to have detonating caps applied to the nipple situated in a chamber.

To the centre part of the breech of the barrel is attached a nipple, running longitudinally into a chamber that opens on each side of the gun, or at the top of the lock, by which means a detonating cap may be introduced on the nipple, and the ram or piston within the lock will cause it to explode, while the air passing through the lateral chamber will ventilate the ignition and carry off the smoke.

Third, a self-priming apparatus, whereby a detonating cap is always presented to the nipple after each fire. A small curved tube passing under the lock, and opposite to the nipple, has a spiral spring therein, by which means the detonating caps are first introduced with their concave part toward the nipple and into the tube; by means of a button working in a grove, the spring can be drawn down for this purpose; an abuttment is made within the lock, just above the tube, in order that the pressure shall always bring the cap opposite the nip, when the ram or piston in striking will carry it forward against the nipple, and cause it to explode.

4. The mode of constructing a pistol with a series of barrels to obtain a central fire. A paul lever working a ratchet causes, at each action of the trigger, the barrel to move round and immediately opposite the nipple.

5. The mode of arranging a series of detonating tubes, which convey the prime in a sloping direction towards the centre of the charge.

6. The mode of applying charges of detonating powder to balls. The balls on this occasion are made cylindrical, with a tube, as air-hole. down its centre; the detonating powder is put in the chamber at one end; thus when the powder ignites by the stroke of the hammer, the ball is forced out of the gun.

Lastly. The method of applying the nipples to fire-arms by screwing them from the interior so as to prevent their being blown out.

ENTERED AT THE ROLLS CHAPEL OFFICE, UP TO THE WEEK ENDING JULY 25, 1840.

(*Continued from Page* 51.)

ENGLAND.

MILES BERRY, Chancery-lane, *certain improvements in the manufacture of prussiate of potash and prussiate of soda*, July 20.—Hitherto the prussiate of potash has only been obtained by incurring the loss of a considerable quantity of azote or nitrogen gas, which when combined with carbon forms cynogen the generator of prussian blue. This azote is evolved by the distillation of organic substances contained in certain vegetables, animal oils, &c., but it is obtained in larger quantities by the calcination of animal substances.

First method or viâ humidâ is to reduce the charcoal into fragments of about the size of a nut or walnut, then dissolve the potash or the salts of potash, such as carbonate or nitrate, in an aqueous solvent in urine, that is if a great quantity can be obtained easily and at little cost, otherwise use common water; with respect to iron, it is to be rendered soluble by the addition of an acid such as nitric or acetic acid.

The solution of potash and nitre is then to be on the charcoal, the saline ley is absorbed very soon, then pour in the solution of iron, stir the mixture with a spatula, evaporate the water which has been used as a dissolvent; taking care that the compound does not become calcined during the operation.

The compound being dry, is again pulverised and introduced into cast iron tubes.

The other or the dry method, has for its object the substitution of a mechanical division instead of an electrical or chemical one. To effect this, introduce the potash, nitre, and charcoal into a barrel with iron filings; place in the barrel, cannon balls; the barrel is then made to revolve on its axis, and the balls will grind the compound and reduce it to small fragments, which will thereby be mixed together; the compound is then removed from the barrel, and introduced at once into cut iron pipes or kept for use in a dry place.

It is not important to name any particular proportions in the compound, but the following has been found to give satisfactory results, when the dry process is employed:—

Take of ordinary potash 20 parts, saltpetre 10 parts, iron filings 20 parts, coke or ordinary charcoal 45 to 55 parts, dried blood 50 parts; and proceed as above stated.

For the wet process or the chemical division, take of ordinary potash 30 parts, saltpetre 10 parts, acetate or nitrate of iron 15 parts, coke or ordinary charcoal 45 to 55 parts, dried blood 50 parts; and proceed as described.

The compound mixture must be introduced when perfectly dry, in a series of pipes connected together and contained in a furnace similar to that used for the manufacturing of carbonated hydrogen gas or coal gas.

The pipes are placed vertically, and care must be taken not to pulverise completely the dry compound, in order that the gases may be able to circulate. The animal matter is placed in a separate compartment or retort, which is connected with the horizontal or vertical pipes, which should be brought to a red heat. The gas evolved, when lighted and coming almost to the color of pink, will denote that the reaction is almost complete, so that very little, if any ammonia has escaped decomposition. When the jet of gas becomes smaller and clearer, while a good heat exists under the retort, one may consider the operation as near its end; the animal matter is reduced into azotated ammonia, and other gases; by combining with the decomposing substances contained, the pipes have been transferred into prussiate of potash.

The charge must be rapidly removed from the pipes, and it being at a red heat, should be thrown at once into water. The whole must be well stirred and allowed to settle; the clear liquor is then to be drawn off, and warm water is to be thrown on the carbonaceous residuum, and well stirred and allowed to settle and then the liquid drawn off.

The strong solutions are to be evaporated, allowed to crystallize, and the prussiate is to be extracted according to the old process. The solutions which are not crystallized, contain carbonated potash which is extracted therefrom to be employed again: when the animal charcoal is completely deprived of azote, a fresh quantity of animal charcoal is substituted.

NOTICE.

In accordance with the determination expressed in our 26th Number, of giving one month's clear notice to Inventors, before publishing their specifications, we hereby inform the following Patentees, that their specifications will be published in the "INVENTORS' ADVOCATE" of Sept. 5. Each party will receive, in addition, a *private* communication to the same effect.

William Brindley, Northwood-street, Birmingham, due Aug. 25.
Thomas Huckvale, Over-Norton, Oxford, farmer, due Aug. 25.
Thomas Farmer, Gunnersbury-house, Middlesex, due Aug. 25.
John Wilson, Liverpool, lecturer on chemistry, due Aug. 25.
Richard Kingdom, M. D., Gothic-house, Stockwell, due Aug. 25.
Thomas Milner, Liverpool, safety-box manufacturer, due Aug. 26.
William Morrett Williams, Bedford-place, Commercial-road, professor of mathematics, due Aug. 27.
James Beaumont Neilson, of Glasgow, due Aug. 29.
Rowland Macdonald Stephenson, Upper Thames-street, due Aug. 29.
Richard Edwards, Fairfield-place, Bow, dealer in emery cloth, due Aug. 29.

FOREIGN CORRESPONDENCE.

FRANCE.

ACADEMY OF SCIENCES, PARIS.

At the sitting of the Academy on the 21st ult., M. Arago made a long detailed report on M. Arnoux's jointed carriages, by means of which he is enabled to overcome the inconvenience of curves on railways. M. Arago took great pains to show all the advantages of the ingenious mechanism of M. Arnoux, but his explanations were not so clear as usual; and the members could scarcely comprehend the mode of operation.

A new arrangement of the microscope was presented to the Academy, which its inventor, M. Donné, says is calculated greatly to extend the use of that valuable instrument. He says he had, previously, partly overcome the difficulty of making microscopic objects visible to a great number of students by means of numerous instruments, and also by the solar and the hydro-oxygen microscope, but the plan had not completely succeeded until he contrived the apparatus exhibited to the Academy. There are now, he observes, no limits to the extent of the use of the microscope, and the objects can be shown in a large amphitheatre as well as to a company of fifty. This method has been adopted in M. Donné's lectures to his students, and by means of it the microscopic objects may be passed from hand to hand as easily as a drawing. This advantage is obtained by the aid of microscopes, which are lighted from within by means of a small lamp, the light of which is reflected immediately on the object by a mirror, so that there is no difficulty in adjusting the light, and it is not liable to get disarranged as it is passed from one student to another in the lecture room.

A letter from M. Boquillon was read, in which he establishes, apparently very satisfactorily, the claims of M. Jacobi to the discovery of the electrotypic method of taking copies of medals and bas-reliefs.

FRENCH AND ENGLISH STEAM ENGINES.

Baron Seguier has addressed a long letter to the *Journal des Debats*, in defence of the French engineers, from the implied attack on them by the minister of public works, when he asserted that they could not make marine steam-engines for large ships so well as the English. The Baron enters into particulars, to show that at several manufactories in France, the means exist for constructing steam-engines on the largest possible scale. "Why then," asks the Baron, "compromise at the same time the dignity and the safety of France, by giving to foreigners orders for the execution of machinery on which the prosperity and the defence of the country depend? Will these machines be better made or more quickly finished than in France? Is it forgotten that improvements in marine steam-engines have for a long time remained stationary in England, owing to the prohibition to employ high-pressure engines? Is it not known that they have borrowed from French engineers all their recent modifications of those engines?" The Baron then proceeds to allude to different improvements made in steam-engines by Messrs. Maudesley and Field, the principles of which he says were taken from French engine-makers; and he alludes to the number of patents continually taken out in England for alterations in steam-engines as a proof that the experience England has, had has not yet enabled her to arrive at any definite plan as to the best method of construction, and therefore, that on the score of experience alone she has no peculiar advantages to offer. Baron Seguier's letter is reprinted in some of the Belgian papers, and is recommended to notice as being equally applicable to Belgium as to France.

NEWSPAPER
INVENTORS' ADVOCATE

BELGIUM.

THE TRANSPORT OF GOODS BY FRENCH AND BELGIAN RAILWAYS.

The Belgian government, in April, 1839, commenced the plan of carrying merchandise by railway, but they did not then undertake any responsibility for the custody or delivery of the goods, and the parties sending them were obliged to take all the risk on themselves, and also to fetch the goods away. The price charged for this imperfect system of carriage was, for a package weighing 1,000 kilogrammes, in some instances 13 centimes, and in others, according to the nature of the goods, 18 centimes, for every kilometre of distance conveyed. This first attempt was profitable to the Belgian treasury, and advantageous to the public. The government is now about to make another experiment in the conveyance of merchandise, the execution of which will serve to throw much light upon the question, to what extent it is desirable that governments should engage in trading operations. The *Moniteur Belge*, of the 23d July, contains a royal decree, which announces that from the 1st of August next the conveyance of goods in all its branches, and without any restriction, will be undertaken by the state. Goods of all kinds, merchandise, luggage, horses and cattle, everything in short, will be received, transmitted, and delivered, either at the houses of the parties to whom they are directed, or left at the stations, at the option of the sender, according to certain regulations.

The *Journal des Debats*, in alluding to this proposed attempt to make the Belgian government into a general conveyance company, compares some of the charges fixed by this royal decree of King Leopold, with those proposed to be made in the contemplated railroads in France. From Antwerp to Brussels, for example, a distance of about 27 miles, the price for the conveyance of 100 kilogrammes, not including small parcels, is for ordinary goods, 55 c., for more valuable articles 65c. and for brittle wares, 90c. The maximum price stipulated in the lists of French charges, as modified in the last session of the Chambers, is very nearly the same as the foregoing for general goods, but the Belgian charges for small parcels are much higher.

With regard to cattle, the Belgian lists of charges differ materially from those proposed for the French railways. In the Belgian regulation, the price of conveyance is less in proportion when a number of cattle are conveyed, than when there are only one or two. For instance, one horse conveyed a distance of 50 kilometres is to pay in Belgium 30c. per kilometre. If the number of horses be three, or more, and the distance travelled be 200 kilometres, the charge per head is only 12½ centimes. In France, the price in all cases is to be 15c. The French list of prices makes no difference between horses and horned cattle, when the number is more than five; in the Belgian list of prices, the charge for horned cattle is only half that for horses. For small cattle, when there are more than twenty, and the journey is 200 kilometres, the Belgian charge is 1c. per head per kilometre. For a distance of 50 kilometres, and for one animal only, the charge is 3c. per kilometre. In France, the charge is uniform for all distances, viz., 5c. per head per kilometre for pigs, and 3c. for sheep.

It must be observed, however, that the French charges are the *maxima* charges permitted to be made by the railway companies. It is well understood, also, that a government has a thousand motives for being satisfied, in similar cases, with smaller profits than private companies would be content to receive.

IMPROVEMENT IN THE TRADE OF ANTWERP.

During the six past months of the present year, there have been imported into Antwerp 36,078 bales of cotton, which is a larger quantity than has been imported in the same space of time at any former period, with the exception of 1829; the quantity would have appeared still greater but for the opening of the canal of Terneuse, as the cotton for Ghent which used to pass by way of Antwerp, and be reckoned among its imports, is now conveyed direct to that town by the canal. The arrivals of cotton at Antwerp during the first half year of 1839 were only 8,677 bales. This extraordinary increase in the raw material, may be considered a proof of the great extension of the cotton manufactures in Belgium. Of the 36,078 bales imported this year, 31,000 were imported direct from America; 3,000 (East Indian) from London, and 3,000 from Hayti and Smyrna. The number of casks of sugar imported at Antwerp during the past six months was 42,015 from Havannah and Brazil. In 1830, the importations during the same period were only 18,000 casks. The same remark in reference to the cotton taken to Ghent direct by the canal of Terneuse, also applies to sugar; therefore, the difference between the two years is still greater than it appears. With regard to leather, another raw material of manufacture, it was expected that the treaty of the 19th of April, which deprived Belginm of a portion of the territory where the most numerous and important tanneries are situated, would have had a detrimeutal effect on the leather trade of Antwerp. Up to the present time, however, it appears that Antwerp retains this branch of commerce, for in the last six months the importation of leather has amounted to 148,890 pieces, whilst in the corresponding period of 1839 the number was only 83,600. "We thus perceive," observes the *Independent*, from which paper we take the preceding accounts, "that, despite the disastrous predictions that have been made, there is no reason to despair of the future prosperity of the country. We see that at Antwerp, the centre of the supply of raw material for our manufactures, the imports have been considerably increased, the business multiplied, and the sales easily effected. Belgium, therefore, possesses all the elements of prosperity, and little is wanting to bring them into proper exercise."

A treaty has been entered into between Belgium and the Grand Duchy of Hesse, for the purpose of enabling the subjects of the respective states to possess and bequeath property in either country.

The commission of commercial inquiry in Belgium, is a roving commission; and the commissioners are now engaged in travelling to different manufacturing towns and districts, to pursue their investigations. They are at present at Ghent.

The learned society that has the direction of the fêtes to be given at Antwerp, in honor of Rubens, have, it is said, contracted with a London gas light company, to illuminate some of the public buildings with gas for the occasion; among others the Place St. Walburgh, where the statue of Rubens is to be erected. This kind of illumination, with stars and other figures in gas, which has not hitherto been introduced in Belgium, is expected to give great eclat to the fêtes.

Railway Smoking Divans.—The managers of the Belgian railroads are having first class carriages made for the convenience of smokers, to be called smoking diligences (*diligences-tobagies*). The *Independent*, in announcing this circumstance, regrets that so much attention should be paid to the comfort of smokers, and considers the practice of smoking in railway carriages will be attended with danger.

THE PENNY POSTAGE.

Returns, showing the effect of the late reduction in the rates of postage, have just been printed by order of the House of Commons.

One return shows the number of chargeable letters passing through the General Post in London since the first reduction was made, and those for the corresponding period of 1839. The result stands thus:—

1839. FOUR WEEKS ENDING	No. of Letters.	1840. FOUR WEEKS ENDING	No. of Letters.
5th January	1,500,916	4th January	2,102,281
2d February	1,543,375	1st February	3,004,266
2d March	1,557,880	29th February	3,338,074
30th March	1,604,356	28th March	3,372,667
27th April	1,656,316	25th April	3,404,900
25th May	1,619,765	23d May	3,461,278
22d June	1,649,020	20th June	3,665,193

The second return relates to the London district post. It appears that in the first four weeks after the reduction from 2d and 3d to 1d, 1,302,555 letters passed through this post. In the four weeks ending June 20, these numbers had increased to 1,702,344, or above 30 per cent. Before any change whatever, the average weekly number of letters was 254,225. The weekly average at the present time is 423,086. So that the metropolitan local letters have increased upwards of 66 per cent.

The third return shows the progress of the weekly numbers for the whole of the kingdom in monthly intervals:—

WEEKS ENDING	Number of Letters.
24th Nov., 1839 (before any change)	1,585,973
22d Dec., 1839 (4d rate)	2,008,687
23d Feb., 1840 (1d rate)	3,199,637
22d March, 1840	3,069,496
26th April, 1840	2,954,866
22d May, 1840	3,138,035
21st June, 1840	3,221,206

Excepting the week ending 26th April, and the first week after the reduction to 1d., it will be seen that the numbers have been increasing for the last three months. It may be as well to remind our readers that the fourpenny rate came into operation on the 5th December, the penny rate on the 10th January, and the stamps on the 6th May.

FUTURE SPEED OF STEAM VESSELS.

Amongst the variety of experiments now making to improve and simplify steam navigation, that which at present most prominently engages the attention of the public, is the substitution of the Archimedian screw for the paddle wheels now in use; and if implicit reliance can be placed upon the account of the recent voyage of the *Archimedes* from London to Hull, during a gale of wind, in which she is reported to have beaten the *Monarch* steamer by five hours, we are on the eve of a most important revolution in steam navigation, as the ordinary paddle-wheels, with their enormous paddle-boxes, must be got rid of before we can hope to attain the maximum rate of progressing through the water by steam. We have long ventured to express our doubts of the accuracy of the received theory of the resistance to solid bodies moving through fluids, and we have stated our reasons for differing from the pretty general opinion respecting the maximum speed of vessels through the water. In our publication of October 8, 1830, we observed that the "resistance to solid bodies moving through a fluid, according to the recognised theory, increases with the speed in such a rate as to preclude all hopes of impelling vessels of any description much faster than our best sailing ships now move by the action of the wind." We have always thought, however, that if ten or twelve miles were the maximum speed of a sailing vessel, the fact is not to be received as a demonstration that a body of the bulk and exact form of our largest vessels could not by any means be impelled through the water at a much greater rate than that we have just mentioned. In our opinion, if a sailing vessel cannot be impelled at a greater velocity than ten or twelve knots, the circumstance is not to

be wholly ascribed to the resistance which the fluid presents to the progress of the vessel, but to another cause. If when a sailing vessel, with all her sails spread, has attained her maximum speed, more sail could be set, the consequence would, in all probability, be either that the masts would give way or the vessel would go down by the head. If we are correct in our theory, the fact that sailing vessels have never exceeded the rate assumed is no evidence that a greater speed is unattainable under any circumstances. That bodies which present much greater surface, and of course much greater resistance to the water than our largest sailing ships do, can move through the water four or five times faster than any of our vessels, is proved by the vast rapidity of the motion of the whale, although its head, or, as the sailors would say, its bow, is much more bluff, and ill adapted for penetrating the water, than the bows of a ship. A whale, when struck by a harpoon, will dart perpendicularly down with such velocity, that it is necessary to moisten the rope attached to the harpoon, to prevent the friction of the rope igniting the gunwale of the boat. We are aware that a whale is gifted with this extraordinary power by the great author of nature, no doubt for the wisest of purposes, and that any attempt of human skill to impart the same energy to our inanimate ships would be futile; but still we maintain, that the rapid progress through the water of so unwieldly a body as the whale with its huge bluff head, proves that the limit ordinarily assigned as the rate of sailing ships is not to be ascribed to the mere resistance of the water, but to the impossibility of carrying more sail. That vessels are capable of moving at much greater speed through fluid than our best sailing vessels, has long since been fully proved by the rate of our superior steamers; and if the statement we are about to transcribe from a recent number of the *Greenock Advertiser*, can be implicitly relied on, the speed of steam vessels exceeds that of sailing vessels thirty or forty per cent.:—

"Steam Wonders.—The same day which saw the *Archimedes* pass the quays of Greenock, also witnessed the first trial of the *Achilles*, previous to her taking her place on the station for which she had been built, between the Clyde and Liverpool. This splendid ship is about 1,000 tons burden, and has engines of larger size than the *Great Western*. Although the day was unfavorable, blowing a gale, the speed of the ship was between fourteen and fifteen miles an hour through the water. This extraordinary speed was accomplished by the engines, which have a stroke of seven feet, making nineteen and twenty revolutions per minute with the greatest steadiness."

We shall not venture to offer any decided opinion as to the speed which it is possible to communicate to a steam-vessel, but we shall venture to express our conviction that the maximum has never yet been attained. We lay considerable stress on the velocity at which a huge and bluff nosed whale is known to be capable of swimming, which demonstrates that the fluids may be penetrated by moving bodies with much more rapidity than is generally imagined, provided an adequate impellent power be applied. *That* is the mechanical problem which remains to be solved, and when we bear in mind the fact that locomotive steam-carriages have lately been moved on our railways at a rate five or six times greater than scientific men believed to be possible when the Liverpool and Manchester Railway was first formed; and when we further reflect upon the various improvements in steam machinery now in progress;—when we take all these things into consideration, why should we doubt that our steam-vessels may at some future, and probably not very distant time, be brought to such perfection as to make the voyage between Liverpool and New York in five or six days, or even less?

Those who may laugh at what we here deliberately commit to paper, would have believed any man mad, who, but a few years ago, should have predicted that a locomotive engine should in the year 1840 travel at the *rate of* seventy-five miles per hour! and yet this mechanical phenomenon has recently been witnessed on the North Midland Railway.—(From the *Liverpool Mercury.*)

RAILWAY INTELLIGENCE,

DOMESTIC AND FOREIGN.

The Greenwich Railway.—The Greenwich Railway Company have lowered their fares to 6d., and a considerable increase of traffic has been the result.

London and Southampton Railway.—The receipts on this railway already exceed £1,000 per day.—*Salisbury Herald.*

Birmingham and Gloucester Railway.—In consequence of the completion of this railway to Broomsgrove, all the coaches between Cheltenham and Birmingham, save one, have been taken off the road by their proprietors.—*Hereford Times.*

Manchester and Birmingham Railway.—A viaduct over the valley of the river Dane, of dimensions nearly as gigantic as the one over the valleys on each side of the river Mersey, in this town, is about to be contracted for on the line of the Manchester and Birmingham Railway, between Wimslow and Crewe. It will have 24 arches, of 63 feet span each, at an elevation of about 80 feet, and will be upwards of 1,700 feet in length. There will be but little difference between the one here, and that over the Dane, except that the former has 26 arches, and the latter 24, with an altitude of several feet less. We suppose the cost will be much the same; the one here being, we believe, £80,000.—*Stockport Advertiser.*

Sheffield and Manchester Railway.—We understand considerable activity prevails in the works on this line since the appointment of Mr. Locke as engineer. Mr. Alfred Jee has been appointed assistant engineer. The contracts from Manchester to the tunnel have been let. It is expected from Mr. Locke's engagements with other railways having for the most part terminated, that he will be able to afford more undivided attention to this one. —*Railway Mag.*

Great North of England Railway.—We understand that the works upon the Great North of England Railway are proceeding with much vigor, and that it is expected the line will be ready for opening as far as Darlington in October next. The whole distance between the metropolis and that town (about 250 miles) will then be traversed with great ease in twelve hours. Already the journey to York is accomplished in ten hours.—*Railway Times.*

Midland Counties Railway.—The travelling on this line, since its opening to Rugby, has much increased, and is still increasing. On Wednesday, one train arrived at the station, comprising eighteen carriages, including several private ones; and next morning a train of twenty two passed along the line, the largest which has ever been known since its opening. A journey may be now made from Leicester to London and back, between the hours of eight in the morning and ten at night, with three hours to transact business in the middle of the day. The journey is performed in less than five hours. The Midland Counties Company use their own carriages, so that passengers leaving Leicester for London by a first or second class carriage, need not quit their seats at Rugby, except to pay their fare. —*Leicester Chronicle.*

North Midland Railway.—In the course of a few days, third-class carriages will begin to run on this railway. This will be a great accommodation to the humble classes of the community, as the rate of charge will be one penny a mile. Thus the charge from Leeds to Wakefield will be 1s.; to Barnsley, 1s. 6d.; and to Sheffield, 3s. 3d.

London and Brighton Railway.—The half-yearly meeting of this company was held on Wednesday, at the London Tavern, John Harman, Esq., in the chair, when the report of the directors and engineer was laid before the shareholders. The former document contained the following paragraph: —"It is proposed to open the line in October, as far as the Star, at Hooley-lane, upwards of sixteen miles from London; and further from a point to the southward of Merstham, to the Three Bridges, near Crawley, a distance of eleven miles, so that the journey between London Bridge and Brighton may easily be accomplished in four hours, as more than half the distance will be traversed by railroad. The directors have been in communication with some of the most influential coach proprietors, both on the Brighton and other roads, who have expressed their determination to avail themselves of these advantages. The whole of the works are progressing very satisfactorily, and the directors confidently anticipate they shall be able to open as far as Haywards Heath, a distance of thirty-seven miles from London, by Midsummer next, and, throughout, to Brighton in the early part of next autumn." It was further stated, that the total cost of the line would not exceed £1,800,000, in raising which, the directors would have recourse to another call. The Shoreham branch, already opened, bids fair to be profitable, and everything attached to the undertaking is in a prosperous and satisfactory condition.

Accident on the Brighton Railway.—A shocking accident occurred on Tuesday upon the railway, near Friar's Oak. Mr. William Smith, a sub-contractor, after riding some distance on the engine, got down, but had scarcely put his foot upon the ground when the engine moved gently on, and crushed one of his feet in a dreadful manner. He was immediately conveyed to the hospital, where he is doing well. When the sufferer arrived at the hospital, he was in such a state of intoxication, from the effects of a pint of brandy which he drank after the accident, as to render it necessary to resort to the use of emetics and the stomach-pump.—*Brighton Gazette.*

London and South-Western Railway.—To the Editor. Sir,—For the sake of the public, I think you will do well to expose an abuse on the part of this company, from which I and many others, who are *daily travellers* on the line, suffer considerable inconvenience. On the first opening of the railway, they granted a monopoly to Messrs. Chaplin and Horne (Mr. Chaplin being himself a director of the company) for the supply of omnibuses to convey passengers to and from the terminus. The consequence is, that there are just *three* of these carriages for the service of each train, bringing sometimes between three and four hundred persons, and the rush for places is something like the scramble at the pit door of a theatre in times gone by; in fact it is dangerous for the passengers, especially those for the city, (to which part there is only one omnibus,) who are constantly jumping out before the train has completely stopped, in order to secure a berth. But this is not all I complain of. The fare, which was *sixpence* for above two years, when only a part of the line was opened, is now raised to *eightpence* when the whole line is completed and the traffic is immensely increased, there being still only the same number of omnibuses employed. The cause assigned for the increase of the fares last winter was, that at that season it was not worth while to take out a license for the full number of passengers, but that cause does not exist now. The licence is again taken out for the full number, but no reduction of fare is heard of. Unless these extortions are continually brought before the public, I feel convinced they will increase, till the legislature is called upon to interfere; but in the meantime, if the directors will not see their own interest in providing a cheap conveyance for passengers to and from their terminus, it would answer the purpose of some spirited and independent coach proprietor to establish a few conveyances to run *punctually* and *expeditiously* from certain quarters of the town in time for the arrival and departure of the trains. The only

obstacle he would encounter from the monopoly, would be his exclusion from the sacred precincts of the station; but the public would very soon get into the habit of walking outside the gates, when by so doing they could avoid a vexatious exaction of even two-pence.

The directors should recollect that a great majority of the public are loud in their complaints of the inconvenient position of the terminus, and it surely is against their own interest to enchance that inconvenience by charging more for the conveyance to it than is charged *by any other omnibus* within the bills of mortality, for the same distance. I know it will be said in reply, that they have heavy tolls to pay, but this is one of the penalties of their remote position, and ought to fall upon the company, who, having saved at least three or four thousand pounds by not bringing their line beyond Nine Elms, can at least afford to make some sacrifice to the proprietors of the omnibuses and the public for coming so great a distance to join their line.—I am, sir, your obedient and faithful servant,—One of the Company's Best Customers.

The Taff Vale Railway is now carried on with renewed vigor. The undertaking improves steadily in public estimation, and its speedy completion is anticipated.—*Shrewsbury Chronicle.*

Maryport and Carlisle Railway.—The first seven miles of the Maryport and Carlisle Railway was opened on Wednesday, the 15th instant. This portion of the line, it is expected, will bring a vast traffic in coals, and enable the coal proprietors at Oughterside and Gilcrux to ship to a tenfold greater extent than heretofore, and at little more than half the cost. The weather was very unfavorable, but, notwithstanding, a great number of strangers were present, and the carriages were crowded with passengers. Twenty wagons of coals were brought down in great triumph and rejoicing, and the engine continues to ply daily with fifteen to twenty at a trip. A party of about forty gentlemen, including the directors and principal shareholders, dined together at the Senhouse Arms Inn, and all seemed unanimous in the feeling, that the line would be a prosperous one, and that after years would see it in active operation from Carlisle to the nearest shipping port, thereby uniting the German Ocean and Irish Sea. F. L. B. Dykes, Esq., presided; and J. Pocklington, Esq, acted as Vice.—*Carlisle Journal.*

Great Leinster and Munster Railway.—Dublin and Kilkenny.—The jurors assembled at Kilmainham, county Dublin, under the precept of the directors, have concluded the valuation of the lands required for the purposes of the railway in that county, and published a high encomium on the able and judicious conduct of the gentlemen concerned for the company during the arrangement. The company have secured the land on very satisfactory terms.

The company for this great national undertaking was incorporated by Act of Parliament, in July, 1837. After having obtained their Act, they were rendered unable to avail themselves of its provisions, or commence operations for the construction of the railway, in consequence of the report of the railway commissioners, and the measure subsequently introduced into Parliament by government, for the purpose of obtaiuing a bill to enable them to construct a railway from Dublin to Cork as a public work. This measure not being sanctioned by Parliament, and having been consequently relinquished by government, the directors, immediately upon learning that railways in Ireland were left open to private enterprise, took the necessary steps for the purchase of the lands required for the railway, and in the short space of one month, have concluded arrangements with the proprietors along the entire line, on terms as advantageous to the company as satisfactory to the landowners, without being obliged to have recourse to the expensive, and too often unsatisfactory adjustment by jury, save in a few unimportant instances.

Previous to the passing of the Act, the commissioners appointed by government to inquire into, and report upon, the best mode of introducing a general system of railways into Ireland, commenced their labors. The company had strong grounds for presuming that the Kilkenny line must form the first portion of any extension towards the south of Ireland that the commissioners would recommend. In this expectation the company were disappointed, for the commissioners, in their report, which appeared in August, 1838, gave the preference to a line through Maryborough to Cork—at the same time it bears this important testimony to the prospects of Kilkenny as a remunerative speculation, for the commissioners state—"That the first thirty miles of the line leading out of Dublin hold out a special prospect of advantage, over which all the traffic of other places, near as well as remote, must necessarily pass"—and it is a source of great satisfaction to the company to be enabled to refer to this able and important document, as affording incontestible proof of the advantages of the line.

The company were, therefore, placed in this dilemma by the report, that they should either construct their line, with the probability of running a line nearly parallel to it, or abandon the undertaking and dissolve the company. The directors determined to adopt neither course, and, relying on the intrinsic value of their line, resolved to wait the issue of the government proposition. Two years having now elapsed, and Parliament not having enabled the government to carry their project into effect, the Irish secretary (Lord Morpeth) having intimated that all lines of railway were now left open to individual enterprise, the company have recommenced their operations, which had been for a long time suspended. The line commences at a field near the Royal Hospital, Kilmainham, and terminates at a place named Pennefather's Lot, in the city of Kilkenny, being a distance of 73½ statute miles; and it is gratifying to remark—and affords a strong proof of the public interest in the success of the undertaking—that the landlords, lessees, and occupiers have, almost without any exception, throughout the entire line, entered at once into amicable arrangements with the company, for the purchase of the land required; and the arrangements of those acting for the company have been attended with such success, that, in the short space of one month, they have agreed for the valuation, or purchase, of all the lands that will be required for the entire line from Dublin to Kilkenny.

A long list of noblemen and gentlemen, proprietors of land on the line, have entered into treaties with the company for the purchase of those portions of their estates required for the railway; and from the general feeling evinced, the company have reason to look forward with confidence to every facility being afforded in forwarding the works.

Railway Prospects.—A correspondent of the *Railway Times*, in a letter on the comparative success of railways, thus speaks of our own line:—"In further confirmation of the *progressive increase* of railways, look at the South-Western, which has risen from £815 a week to £6,432, or from £35 a mile a week to £81. This may appear small in comparison with the Birmingham, which is now taking at the rate of £148, but then there must be taken into consideration the cheapness of its construction; it has cost but £26,000 a mile, while the Birmingham has cost £50,000; or, to make a proportion of it, the South-Western is taking at the rate of £172 a mile a week to the Birmingham's £148! What enables the Grand Junction to declare its 14 per cent., but the cheapness of its construction; and why may not the South-Western, when it shall have been established the like number of years, declare the same? This may be counting your chickens before they are hatched, but every great line of railway only confirms me in my anticipations."

Railway Shares.—A curious fact in reference to forced sales of shares, was stated by the chairman of the York and North Midland Railway Company at their late meeting. It appears that an individual, holding shares in the company, had become insolvent; had he been compelled to sell his stock at the then market price, his creditors would have suffered great loss, whereas, having been allowed a little indulgence, he was ultimately enabled from the produce of the sale to pay the whole of his debts, and realise a considerable surplus for himself!—*Railway Times.*

Brussels.—The railroad from Brussels to the French frontier is getting on rapidly. It has long reached from the Belgian capital to Halle, and the line from Halle to Tubise was finished on the 18th of May last. These two sections measure together about five post leagues. Contracts have been entered into for five other sections, and at this time the works are progressing on all these points at once, so that the whole road will probably be completed before the end of next year.

Amsterdam.—The first locomotive made in this country, of which we lately said a trial had been made, has been put into actual service, and surpassed in speed the English locomotive. It drew the train from Amsterdam to Haarlem in 20 minutes, which is some minutes less time than the English locomotive can travel the same distance.

Fares on the Brussels Railroads.—The fares on the Belgian railroads are very reasonable, and, notwithstanding the advantages we possess in England in the working of these means of conveyance, the accommodation afforded by them in Belgium far surpasses in cheapness the railroads in England. The people are not, however, quite satisfied with the arrangement, and we find some of the Brussels papers contending for a diminution on the rates charged by the second and third class carriages, which, it is contended, are higher in proportion than the fares of the diligences, or first class carriages. The following calculation, by which this is shown to be the case, will give at the same time an insight into the working of the Belgian railroads:—

A train of twelve diligences from Brussels to Antwerp (a distance of 27 miles), each coach containing 18 persons, or 216 passengers in the whole train, at 3 fr. 50 c. each, will produce 756 francs, and the expense of the journey is 135 francs. This train, therefore, supposing it to be full, would yield a profit of 621 francs.

A train of twelve char-à-bancs (second class enclosed carriages), containing 30 persons in each, and carrying, therefore, 360 passengers, at 2fr. 25c. a head, produces 810 francs. Deducting the general cost for locomotives and management, which is about 15 fr. per league, or 135 frs. from Brussels to Antwerp, the profits on a train of char-à-bancs full of passengers would be 675 francs.

A train of twelve wagons (third class carriages), containing 30 passengers in each, or 360 persons in the whole, at 1fr. 75c. a head, would produce 630fr. Deducting the expense, the net profit on a train of wagons filled with passengers would be 495 fr.

The result of this calculation, it is observed, shows that the diligences, which cost and weigh more than the char-à-bancs, and which carry only eighteen passengers instead of thirty, produce less than the char à-bancs by 54 frs., besides being an additional expense; therefore the passengers in those carriages are not made to pay in their proportion of the fares, either for the additional comfort afforded them, nor for the gratification of their pride. The inference drawn from this statement of the case is, that either the fares by the char-à-bancs and wagons should be reduced, or that by the diligences be raised to a degree proportioned to their superior comfort and expense. The effect of such an increase, it is admitted, might induce many of those who now travel in the first class carriages to go in the second class, but this, it is argued, would not be a loss to the management of the railways, because the greater expense of the first class carriages, in proportion to the number of passengers conveyed by them, makes it of less advantage to the management to convey passengers by those car-

riages than in the char-à-bancs, with the present fares.

The case is different as regards the wagons, because if the price of conveyance by them be raised so as to prevent the laboring classes from travelling by railway, the profit on the conveyance is altogether lost. The advantage of keeping the fares by the wagons at the lowest possible amount, and of raising those of the first class carriages, is thus shown to be greatest, not only to the public, but to the railway management.

GLASGOW AND AYR RAILWAY.—We understand there are great hopes that the line of the Glasgow Railway will be opened all through in the course of next week, as the obstruction caused by the deep bog, so often referred to, is in a fair way of being overcome.—*Glasgow Argus.*

The *Hants Independent* states, that in future the British Queen will land and embark passengers at Southampton, instead of Portsmouth, as at present: the railroad to London is the probable inducement for this change.

GRATUITOUS COPIES

of our Journal have been forwarded to a number of Individuals interested in some Patent, or Invention, of which notice has been taken in our number of to-day.

TO CORRESPONDENTS.

We shall, at all times, be ready to ANSWER QUESTIONS *that may be put to us, relative to any of the subjects indicated in our title; and questions put during the current week, will be replied to either the same, or following week.*

"THE INVENTORS' ADVOCATE, *and* JOURNAL OF INDUSTRY," *may be forwarded,* postage-free, *to all the undermentioned places:—*

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Brazils	Grenada (New)	Spain *via* Cadiz
Bremen	Halifax	St. Domingo
Buenos Ayres	Hamburgh	St. Kitts
Canada	Heligoland	St. Lucia
Caraccas	Honduras	St. Vincent's
Carthagena	Ionian Isles	Tobago
Cephalonia	Jamaica	Tortola
Columbia	Laguayra	Trinidad
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Cuxhaven		

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"A. L."—*As the specification is due to-day, and proper notice was given to the party of its intended appearance in our paper, it cannot be withholden* under any circumstances. *We have never yet deviated from the plan we laid down, nor do we ever intend to do so.*

"E. T."—*Six months.*

"Engineer."—*It appeared in No.* 13 *of the* "Inventors' Advocate."

"A Citizen."—*The "company" is a highly respectable one; indeed the names of the directors are a sufficient voucher for the fact.*

TO OUR SUBSCRIBERS.

TWO *numbers of the* "INVENTORS' ADVOCATE" *(Nos.* 48 *and* 49*) were published* July 4. *The former contains, in addition to the usual varied matter, the* TITLE PAGE *and a* COPIOUS INDEX *to the* SECOND VOLUME.

VOLUME II. *of the* "INVENTORS' ADVOCATE," *handsomely bound, is* NOW READY. *A* FEW COPIES *of the* FIRST VOLUME *still remain on hand.*

TO INVENTORS.

ALL PERSONS who may be desirous of TAKING OUT PATENTS, or of bringing VALUABLE INVENTIONS into USE, are requested to APPLY to the PROPRIETORS of "THE INVENTORS' ADVOCATE," (DELIANSON CLARK & CO.) at their "PATENT AGENCY OFFICE FOR ALL COUNTRIES," 39, CHANCERY LANE, where they may be consulted, daily, relative to the PATENT LAWS of GREAT BRITAIN, and ALL OTHER STATES.—(See ADVERTISEMENT on the last page of the present Number.)

THE

INVENTORS' ADVOCATE,

AND

JOURNAL OF INDUSTRY.

SATURDAY, AUGUST 1, 1840.

A short but interesting debate took place in the House of Commons, yesterday week, relative to the employment of private companies for the steam-packet communications between England and her distant possessions. The discussion arose on the proposition to vote £21,600 for the accelerated conveyance of the mails between Falmouth and Alexandria. The vote was objected to by Mr. Dawson Damer, on the ground that it is inexpedient for the government to act, in a matter of such importance to our naval power, through the the agency of private companies. It would be much better, he thought, for the government to employ steam-vessels of their own, which might be constructed so as to become serviceable, when occasion required, as powerful ships of war. The Chancellor of the Exchequer in defending the course pursued by the government, observed that it would be found much more beneficial to the public, in an economical point of view. All the advantage of having at command a large number of first class steam-ships, convertible into ships of war, would be equally obtained, as these packet-ships might be easily armed with heavy guns, and taken into the government service. Mr. More O'Ferral also stated, that during the time he was in office, in all the contracts entered into for carrying the mails by steam-packets, there was a stipulation that the vessels should be capable of carrying heavy guns.

We are glad to find that the importance of having large steam-packets, capable, when required, of being converted into powerful armed ships, has attracted the attention of government and the House of Commons. We were the first to direct public attention to the subject, for in the *Inventors' Advocate*, of the 23d of May, we adverted to the advantage England would possess over other nations in time of war, from the greatly superior steam navy she would be able to fit up and bring into action. We alluded at the same time, to the contracts the government had entered into with private companies, to carry the mails to America and to the East and West Indies in ships of the largest class, as affording the means of still further increasing our naval power. A few days after our article on the subject, appeared, the question of forming a steam communication between France and America was debated in the Chamber of Deputies, and the principle of combining utility with warlike capabilities was embodied in the project of law on the subject. We are glad to find that the views we then took of the importance of keeping in active operation a number of large steam-ships as packet boats, have been confirmed by the French government, as well as by our own. These steam-packet ships will constitute one of the elements on which our future naval superiority will depend, and, without presenting a hostile attitude, we shall be always ready, at a very short notice, to equip a formidable fleet of steam-ships superior to those of the combined powers of Europe.

With regard to the question whether these large steam packets should be supplied by individual companies, or by the direct agency of the government, we are strongly disposed to favor the plan that has been adopted. The principle of aiding the formation of private companies, by granting them the contract for the conveyance of the mails, amounts in practical effect—only more beneficially to the public—to the system adopted by the French government of promoting the formation of railway companies by guaranteeing a *minimum* of interest. Private enterprise and a large amount of capital are thus brought into profitable activity, with a considerable saving to the country. Five public companies have been formed for carrying out the government views of steam communication with distant

parts of the globe, the united capitals of which amount to about four millions sterling. Had the government undertaken the responsibility of constructing, and fitting out the ships for these different lines, they could not have stirred in the matter without a loan of several millions; and Parliament would not at the present time have been willing to add to the national debt for such a purpose. The annual saving, too, compared with the amount of interest on so large a borrowed capital is important; unless we conceive the government could, like a private company, make a profitable speculation by the conveyance of passengers. For the speedy and effective accomplishment of the object in view, therefore, and for economy in its continued execution, the system adopted appears to present superior advantages to any other proposed.

We have before us, the report by Mr. Holmes of his plan of steam communication with India, *via* the Red Sea, from which it appears that in order to obtain a profitable result, no ships should be employed on that service of less burden than 1,000 tons. The ships he proposes to employ, are to be built of iron, on a plan of his own, and of the enormous size of 2,617 tons. The advantages of large ships on a long voyage are forcibly pointed out in Mr. Holmes's report, not only in point of economy, but in their capabilities at sea. Now if a fleet of ships of this magnitude were constructed on the five contemplated packet lines, this country would have at command a fleet of 30 ships of the largest size, each one of which would, when armed, be greatly superior to a first-rate men of war, if fighting against each other. This formidable addition to our naval strength, will be made without any expense, until the packets are actually wanted as ships of war, and instead of lying idle, and rotting in harbour, as is the case with our large fighting ships, these steam-packets will be in constant profitable employment until the necessities of the times require them.

REGULATION OF RAILWAYS.

The consideration of the clauses of the Railway Bill, in the House of Commons, at the end of last week, elicited some remarks from Sir Robert Peel, and other influential members, that will, we trust, have a most beneficial effect on the management of those monopolies of conveyance. The tendency of the fourth report of the present committee on railways, on which we commented last week, is so adverse to the interests of the public, that we feared the directors might, with the countenance of the committee's report, be induced to raise their charges still higher, but the observations in the House of Commons on Thursday will, we think, effectually prevent them. The principle was distinctly announced, that any public company which derives peculiar privileges from Parliament, on the ground that their exercise will be for the public good, is answerable to Parliament for the fulfilment of that condition. The privilege of a monopoly of conveyance is granted by passing an act for the formation of a railway; and the foundation on which such acts are granted is, that they will benefit the public by facilitating and cheapening the means of communication. There exists, therefore, not only an equitable right to interfere in the management of railways, but it is the positive duty of the legislature to ascertain that the conditions of the monopoly are complied with.

The principal and immediate object of the Railway Bill now before Parliament, is to provide for the protection of the passengers against personal injury, arising from imperfection and incompleteness in the construction of the works. For this purpose, provision is made for the inspection of railways before they are opened; and for the supervision of them whilst they are in operation; and penalties are imposed upon parties who place any thing on the roads that might throw the carriages off the rails. Some rather stringent provisions are also introduced for the protection of the public from the insolence and misconduct of the servants of the company.

These regulations are good, so far as their objects extend, but there is still a great omission in this respect, as regards the engineers, who are the officers on whom the safety of the public most depends. Until measures are adopted to secure the services of a superior class of men, whose standing in society and moral character would guarantee their good conduct, the best security against misconduct and negligence is the dread of punishment. The engineers are not, however, distinguished in the bill from the other servants of railway companies, and the penalties for misconduct, though sufficient for ordinary cases, are far from being adequate punishment for instances of carelessness or neglect that might endanger the lives of all the passengers. At present, the directors of railway companies feel sensibly the inefficiency of the law to punish the misconduct of the engineers of locomotive engines, and we hope some clause will be introduced in the present bill to remedy this defect.

The railway interest in the House of Commons, reserved the main strength of their opposition to the measure for those clauses that provide for an investigation of their accounts. They founded their objection on the plausible pretence, that a parliamentary investigation of the accounts of a trading company would establish a precedent for obnoxious inquisitorial interference, that might be extended with equal justice to the affairs of all other companies. They were driven from this position, however, by the principle laid down by Sir R. Peel and others, to which we have alluded, that the grant of peculiar privileges, on condition of performing certain duties, necessarily involves the right to see that those duties are properly fulfilled. The clause in the bill, for enforcing the inspection and publication of accounts, requires the directors to furnish very minute details, not only on matters of finance, the number of passengers, the receipts, expenditure, &c., but it requires a return of the number of personal accidents, and other particulars likely to affect the public interests. It is from the operation of this clause, that we expect the greatest advantage will be derived from this railway act. It will indeed establish a precedent for searching examination into the management of railway companies, and the profits derived from their exorbitant charges.

It appears from a statement which we have given in another part of our Journal, from a Brussels paper, that the general cost of management and the expense of working the railways in Belgium, is 15 francs per league. The fare from Brussels to Antwerp, by the second class carriages, which are nearly as commodious as the second class carriages on most of the English railways, is two francs and twenty-five centimes; which is less than two shillings, for a distance, by railway, of about twenty-seven miles. The amount received at this rate of charge from a train of second class carriages, filled with passengers, is upwards of five times the amount of the cost and management. Supposing, therefore, the carriages to be only one quarter full each journey, there would still remain a balance of profit of nearly fifty per cent.

Now, it is evident, if the Belgian railroads can be profitably worked with fares which are equivalent, in regard to the respective distances, to a charge of eight shillings from London to Birmingham, there must be great mismanagement if an adequate profit cannot

be obtained in this country from fares less than twenty shillings. The fare by the third class carriages on the Brussels and Antwerp railway, is equivalent to a charge of only six shillings from London to Birmingham, and if an approach to that scale could be made in England, the promised benefit of conveying the laborer "cheaply and rapidly to that spot where his labor might be most highly remunerated," would be realised. But the third class carriages, for the accommodation of the laboring classes, have been for a long time discontinued on the Birmingham, and on other railroads, to and from London; therefore even the pretext of affording facilities for their conveyance has been abandoned.

Nothing can be done this Session of Parliament to remedy, by legislative measures, the grievance of high charges by railways in the south of England; but the bill that is now in progress will be the means of gaining information on which to legislate next year, and we hope that it may also have the effect of inducing the directors to make material alterations in their system of management and scales of charges, to obviate the necessity for parliamentary interference.

NEW INVENTIONS.

THE PATENT WIRE ROPE.

The patent consists of improved methods of combining any number of wires, and thus forming a rope perfectly flexible, and which can be spliced, knotted, and fitted in the ordinary manner. The manufacture appears to be well deserving the attention of all parties engaged in mining operations, the wire ropes having been proved to be of much greater strength than those generally in use, (when the comparative weights of each description are taken into account,) and the effects of oxidation or decay are completely prevented by a chemical preparation.

THE VAL MARINO LIGHT.

A few days since, there was another exhibition of Count de Val Marino's new light, in Mount-street, Berkeley-square. The invention consists in this—that whereas the present gas light is produced from the best coal, the Val Marino light (a light equal in brightness, &c. to any light) is produced from the refuse of coal. Nor can any thing be more simple than the process by which the material for the new light is generated. There are three retorts, the first of which receives the water, and the third receives the tar or refuse of coal. The water is decomposed in the first retort into its various components (gases, &c.), which components ascend through the second or middle retort, where they are atomised; and proceeding into the third retort, they there unite with the atoms of the tar, and the union constitutes the material of this valuable light. The degree of heat applied during the process is a high degree, or what is commonly called a "red-white heat." The apparatus is simple in the extreme. Thus it is, that by the most easy means a light is generated, at a cost so slight that it is beneath consideration. The benefits to be derived by the 'public from such a system, appear to us incalculable. The light resulting from the new system was exemplified in a brilliant star, lamps, &c., and was looked at with great curiosity by the gentlemen present.—*Morning Herald.*

THE AQUATIC LIFE HAT.

We have seen a most simple yet important invention for the preservation of human life from drowning, which seems likely to answer the purpose intended. Its great excellence consists in adapting that part of the dress which is universally worn by persons of all stations, to the purpose of a life buoy, and is so contrived that there is not any difference in the appearance when worn, from a common hat. The person using it can, at his pleasure, while supported by it, increase its buoyancy sufficiently to save three persons, independently of himself, whom he may see struggling beside him. The life hat might be usefully introduced in the Royal Navy, the different yacht clubs, merchant vessels, and amongst watermen. Life hats in the shape of ladies' riding hats, or beaver bonnets, if preferred, may be used, so that the most timid may be at perfect ease as to their security on the water. The invention has been patented, and may be seen at Mr. Pond's, in Cheapside.—*Morning Post.*

SCIENTIFIC MEMORANDA, AND NOTES ON ART.

Scientific Institute at Vienna.—It is stated in a letter from Vienna, that a number of distinguished scientific individuals have memorialised the government for the formation of a scientific and literary institute at Vienna, similar to that of Paris, omitting the branch of moral and political science. It is expected that government will attend to the recommendation, as the greater proportion of the members of the Austrian cabinet, particularly Prince Metternich, have spoken strongly in favor of the foundation of such an institution, as there are not at present in Austria any large scientific associations, and not one academy of sciences.

Coincidence between the Pulsation of the Human Body, and the Hour of the Day.—To the Editor.—Sir—Having seen in your independent journal of this day, a letter signed "Secretarius," in which the writer points out what he regards as a *coincidence between the pulsation of the human body and the hour of the day*, perhaps you may be able to find room for a few words in explanation. Some years ago, I frequently made the experiment described, and always with a similar result; but subsequent consideration compelled me to account for the phenomenon on a principle different from that which is adopted by your correspondent. When a person, knowing the actual hour of the day, and believing in the infallibility of the experiment, undertakes to exhibit it to others, he naturally feels in a considerable degree excited, anxious, and interested in the success of his attempt. This nervous emotion gives increased velocity to the circulation of the blood, which, communicating a proportionate energy to the pulse, gradually extends the range of the vibration of the shilling, so as to enable it at length to touch the glass. No sooner, however, has the desired object been accomplished, than the agitation of the performer subsides, the blood immediately obeys the influence of this altered state of the feelings, the pulsation of the thumb grows weaker, and the shilling is soon found to be almost stationary. The truth of this theory is, I think, clearly proved by the fact that the shilling may be made to strike the glass any number of times, not only from one to twelve, but from one to fifty or more, according to the will of the person who performs the experiment.—Your constant reader, J. W.
London, July 25, 1840.

Trial of a Fire Escape.—On Saturday morning, between eight and nine o'clock, a trial was made of a fire escape, of exceedingly simple construction, at the house of Mrs. Heppel, at the corner of Mansion-house street, before the Lord Mayor, the City Police Commissioner, Mr. Braidwood, the superintendant of the fire brigade, and several merchants and inhabitants of the city. The fire escape consists merely of a length of sheeting sewed into the form of a bag, open at both ends, and having the orifice at the top distended by a loop of cane, and strengthened by a rope formed into loops on each side, by which the machine is suspended from hooks within the window. It is made of sufficient length to reach to the opposite side of the street, where it is firmly held by two persons, thus forming an inclined plane, along which any person may descend with perfect ease and safety. The descent was made a great many times from a window on the third floor of the house, which is very lofty, by one of the city police, and by other persons, one of whom brought a little boy down with him on his shoulders. Those who witnessed the experiment said they were quite satisfied of the great efficacy of the escape, and expressed their astonishment that a thing so simple and so effective had not been thought of and adopted years ago. The merit of the invention is, we understand, due to Mrs. Heppel. The Lord Mayor, who has given a great deal of consideration of late to scientific matters of the kind, suggested, we understand, some addition, which, in the opinion of Mr. Harvey and Mr. Braidwood, may make the escape even more perfect; and it is the intention of Mrs. Heppel to adopt it in the machine, which she will cause to be permanently fastened to the window from which the experiment was made. It was reported that the Lord Mayor intends to make a descent from one of the high windows of the Mansion House, in an escape of Mrs. Heppel's invention, improved by his lordship's own suggestion.

Present to Prince Albert.—His Royal Highness Prince Albert has lately received a present of a very singular and beautiful description. It consists of a small glass beehive, filled with delicately-white combs, so curiously wrought, and stored so fully with the purest crystal honey, as to excite admiration and astonishment. It is a natural curiosity of its kind, perhaps never before met with. The combs, which are of a very unusual thickness, are worked so curiously together, in some parts circular, others perpendicular, and in other parts even in a horizontal direction, that whilst occupying all the available space within the glass shade, with here and there a waxen pillar prudently thrown out to support the weight of the sweet treasure contained, it still preserves and presents a uniform and very elegant appearance. This singular glass of honey was worked in the apiary of Mr. J. Bathem, a gentleman residing near Kidderminster, by whom it was presented to his Royal Highness. The illustrious prince was much pleased with this specimen of insect ingenuity.—*Worcester Chronicle.*

Extraordinary Ornithological and Ichthyological Phenomena.—Off "Burnham," a small watering-place in the country of Somerset, facing the Welch coast, and but a trifling distance from the mouth of the river "Parret," immense shoals of fish congregated from time to time throughout the said months, which in dimensions and other particulars exceeded all precedent in that quarter. Various were the conjectures as to their proper denomination: some maintained that they were of the "ling," some of the "hauk;" others, with mere pertinacity, that they were of the "haddock" kind; not so only, but that they stood at the head of that species, as by certain characteristics exhibiting full proof of their being the true North Sea cod. What the largest amounted to in bulk, when inhabiting their more genial depths in the season and in their prime, may be difficult to determine with any precision; several selected out of the multitudes taken, have weighed each nearly thirty pounds. To every one who has witnessed the taking of the cod on the banks, or off the coasts of, Newfoundland, it is known that the head of the fish is, as it were, lost in the fulness of the jolcs and the protuberance on the shoulders, every inch tapering thence being all along couched in such sleekness as to give out the sombre green shadings on the back, and the blended hues of azure and silver on the belly part to admiration. The immigrants before-mentioned presented a reverse of the picture—an enormous skeleton head of some, as they hung on the stalls, canopying what may be termed an apology only for a carcase, both thus contributing to prove how marvellously the principal must have lost of its pristine figure and consequence. It may be going out of the way to submit, as to whether any of or all the fishes in the sea or out of it would in such emaciated condition constitute fit food for man, especially when the system had, from adverse circumstances, been long kept, as may be said, under par, yet it was wonderful to see with what eagerness these described were sought after and purchased by the poor, often under 1d. per pound. An equally extraordinary change occurred during the said months amongst the wild fowl frequenting the adjacent coast, and the extensive moors leading thence inland, formerly (that is, before the late reclaiming) the winter rendezvous of wild birds of all descriptions, the lesser have seemingly in no small degree expelled the greater. Of late, neither wild geese, mallard, (as they are provincially called) widgeon, nor dun-birds, have been observed in any such like quantities as heretofore, to the astonishment of the oldest fowlers, whilst the smallest of the duck tribes, the teal, has in countless numbers of its kind taken and maintained possession, reinforced in proportion to their thinning by every practical device and means. At one period of the season indeed, any number of these tiny "*innovators*," as they may be termed (to such extent at least), seemed to be attainable: not an inn in any direction, for miles from the scene of capture, but had its larder stored with them: daily were they hawked as fresh taken about the streets. Multitudes found their way by every species of carriage to the Bath and eventually to the London markets; whilst quantities taken and reserved alive at the decoy ponds were brought up by sportsmen for shooting out of trap-holes as pigeons are shot at the "*Red House.*"—*Old Sporting Magazine* for July.

VARIETIES.

Hungarian Yeast.—The yeast prepared by the Hungarians will keep for a whole twelvemonth. During the summer season, they boil a certain quantity of wheaten bran and hops in water.—The decoction is not long in fermenting; and when this has taken place, they throw in a sufficient portion of bran to form the whole into a thick paste, which they work into balls, that are afterwards dried by a slow heat. When wanted for use, they are broken, and boiling water is poured upon them; having stood a proper time, it is decanted, and in a fit state for leavening bread.—*Foreign Literary Gazette.*

Discovery of an Inhabited Island.—Captain Wood of the ship L. C. Richmond, lately arrived here, discovered while

on his passage out, an island in latitude 15 deg. 37 min. south, longitude 175 deg. 25 min. west. It was a large island, well wooded, and apparently thickly inhabited, judging by the lights seen on shore at night. Captain Wood not having seen the island marked in any of the charts, named it "Brimsmade's Island."—*South Australian Register and Port Philip Herald.*

New Operation of Tenotomy.—The name of *tenotomy* has been given to a new surgical operation, practised with great success in Berlin, in the cure of squinting, which consists in dividing the muscles under the skin. The term, however, applies to all operations of the same nature, whereby the instrument is introduced through a small incision made in the skin, and the wounds inflicted by the instrument are by this means not exposed to the action of the air. The effect of this mode of operation, it is said, prevents the inflammation and inconveniences attending the usual modes of operating. As is usual in all new discoveries, disputes have arisen as to the merit of being the inventor of the practice. M. Dieffenbach, of Berlin, considers his claims to be established; and so far as the operation has been applied to the cure of squinting, he seems, from the number and success of his operations, to have the best claim. In a recent communication to the Academy of Sciences, he announced that he had performed 175 operations of the kind, whilst M. Guerin, the French competitor for the honor, has only operated in six cases. Notwithstanding the success of M. Dieffenbach and others, some surgeons doubt the efficacy of the plan of curing squinting by dividing the muscles of the eye; among them is M. Roux, a distinguished surgeon of Paris, who has tried it in two cases without success, and to the great pain and inconvenience of the patients. He, however, did not adopt the sub-cutaneous or *tenotomic* mode of operating, to which he is not a convert. The six cases in which M. Guerin has operated on that plan were successful, and not accompanied with inflammation. M. Roux, indeed, recommends the exercise of the muscles of the eye, by directing one at an object whilst the other is closed, as the best remedy for squinting; and he is an instance of what may be done in that way, as he entirely cured himself of the defect when he was twenty years of age, by a forced exercise of the muscles of the eye. The *Journal des Debats* mentions an operation on the tenotomic plan of a very interesting character, that was recently performed in Paris. A young and distinguished medical professor, of the university of Casan, in Russia, in consequence of a fall about two years ago, lost the use of his left hand and arm; the muscles became contracted, the wrist turned round, and his fingers were bent firmly against his hand. He had consulted most of the eminent surgeons in Europe without success; and he at last applied to M. Guerin, having seen him practise the tenotomic operation successfully in some similar cases. The operation was performed in the presence of his relations, and of several visitors; and, before it commenced, he read to them a description of the complaint, and explained the principle of the operation about to be performed. He then held his arm to the operator, and assisted in the operation, bearing the pain with the utmost calmness. It was requisite to cut through all the muscles between the elbow and the wrist, and through all the tendons above the wrist. As the tendons were divided, they made a horrible cracking noise; but he evinced no sign of weakness or pain; and as the operation proceeded, he continually spoke to his sisters, who were crying, and told them not to be afflicted. The success of the operation is not yet determined.

Berlin, July 23.—It is reported that a plan for the regulation of the press has been drawn up, by which great works relative to the sciences or *belles lettres* shall be wholly exempt from the censorship, and the journals have greater liberty than at present. Persons whose rank in society, or in the learned world, afford a sufficient security, will likewise be exempted from the censorship, as was the case in the time of Frederick the Great. The professors of the University, the members of the Academy, persons high in office, are to be among the persons exempted.—*Borsen Halle,* July 24.

Discovery of Ancient Coins.—On Thursday last, as some laboring men were employed in pulling down a wall on the premises of Mr. R. Wippell, Brampford Speke, they discovered a large quantity of silver coin of great value, upwards of 40 pieces of which were coined in Queen Elizabeth's reign. —*Plymouth Journal.*

The Umbrella Manufacture.—A beautiful specimen of manufacture in the umbrella department, has been sent out in the *Englishman,* of this port, to the coast of Africa. It may, with propriety, be termed a parasol, or sun umbrella, being, when extended, capable of screening upwards of thirty individuals.—*Bristol Mirror.*

Mr. John Cockerill's Will.—The *Commerce Belge* states, that the will of Mr. John Cockerill has been opened, and gives the following as the principal clauses:—Mrs. Cockerill is appointed universal legatee, with the whole of the property for her life. At her death, after the deduction of legacies to each of his natural heirs, the property is to go to his brother, Mr. William Cockerill, and in the event of his death, without issue, it is to belong to the nephews and nieces, with the exception of the concern at Liege, which is left to M. Barthold de Suremond, his nephew by marriage, on condition of his keeping it up under the firm of Charles James, and John Cockerill. The executors are Mr. William Cockerill, M. de Suremond, sen., and M. Greenville.

Total Destruction of the Island of Ternate.—A letter from Batavia of the 30th of March, contains the accounts previously brought by the English papers of the total destruction of the island of Ternate by an earthquake. The desolation is so complete, that the inhabitants had scarcely time to escape to the island of Timor, without saving any part of their property.—*Dutch paper.*

Sugar an Anti-Scorbutic.—It is a curious fact, that in countries where sugar is much used, scurvy and other cutaneous diseases are almost unknown. On board American vessels, where the seamen are allowed the use of sugar at pleasure, such a disease as the scurvy is scarcely heard of; and would the cheapness of sugar permit the British shipowners to be as liberal to their seamen as the Americans are, the health of that class of men would be materially improved.

The Indian Government has decided on passing all letters of the officers and men on the China expedition free of postage.—*Globe.*

Explosion and Loss of Life.—On Friday morning, the boiler belonging to the steam-engine in Chally Mead mill (the property of Mr. Wiltshire, distant from Melksham one mile) burst with a tremendous explosion. The boiler was blown above the highest tree, and fell into a pond near; the roof was carried about 100 feet up the road from the premises, some of the tiles lodging in the trees; and part of the rafters and bricks were carried into an adjoining wheat field. The man whose business it was to attend the engine, was dreadfully scalded, and received a severe fracture in the head, which occasioned his death in the evening. He has left a wife and five children. His little boy, who attended him, was slightly scalded. The persons in the mill at the time, received a severe shock, but were unhurt.—*Wilts paper.*

Influenza among Cattle.—A disease, which in its symptoms very much resembles influenza, is extensively prevalent among cattle in this neighborhood and the county. One agriculturist in this vicinity, has had no fewer than twenty of his flock ill at the same time; the consequences are serious to health, and the milk given by the cows when in that state is altogether useless. It is supposed that the epidemic has been communicated by infection. The animals are affected by a running at the nose, trembling of the body and limbs, and loathing of food. These are the symptoms of a cold, but it is not improbable the disorder may have been aggravated by the very great prevalence of blight this summer, and by the condition of the pastures. Last week, the meadows were as brown as if there had not been any rain whatever for many months, and the want of nutritive food for cattle has been much felt. This, and the disorder alluded to, satisfactorily account for the high price of butter of which there have been many complaints.—*Hereford Journal.* [The use of milk in the metropolis is now very generally dispensed with; it having been found to produce irritation, and, in many cases, inflammation in the gums and roof of the mouth. The butchers, too, we understand, have scarcely any demand for beef or veal.]

Destruction by Fire of a Large Cotton Manufactory at Manchester.—Manchester, July 27.—Last night, the extensive cotton manufactory of Messrs. Stocks and Son, situated at Heaton Mersey, was totally destroyed by fire. The building was upwards of 40 yards in length, about 12 or 14 yards wide, and 7 stories high. Nothing like an accurate estimate of the loss can yet be formed. I have heard it variously stated at from £15,000 to £30,000. The origin of the fire is wholly unaccounted for. It is a matter of deep regret to know, that between 600 or 700 hands will necessarily be thrown out of employment by this calamity.

Discovery of English Antiquities at Calais.—(From a Correspondent.)—The city of Calais was the last continental fortress that remained in possession of the English, after they had been driven from Normandy, Guienne, and the other apanages or matrimonial acquisitions of the Plantagenets. The numerous travellers who visit France, generally make it a point to inspect its venerable cathedral, on account of the altar, which is looked upon as one of the most perfect of its kind, but its richness is sadly contrasted with the bare, massy, and whitewashed pillars by which the roof is supported. A few days ago it was ascertained, by the merest accident, that, underneath the coats of whitewash which had accumulated on these columns for many generations past, a variety of fresco paintings were hidden; and the antiquarian spirit was strongly excited by a knowledge of the fact. The pavement of the church at the present moment is covered with the plaster, which a dozen workmen are busily employed in removing from the pillars at the expense of the committee of agriculture, arts, and commerce of this place; and there is no doubt, from what has been already brought to light, that much curious heraldic and other family information will be obtained. From the two large pillars in rear of the altar, and between the choir and the sanctuary, the whitewash has been almost entirely stripped, and one exhibits the interior of a chapel, in which St. George is actively crushing his old foe, the dragon, while in the distance, the walls and spires of a town are visible, with various other features, which will be more clearly discernible as the chalk is removed. The framework of this painting on the two sides, and the bottom, consists of a score of coats of arms, and the top is occupied with the pious scroll, "Orate pro animâ Thome Wodehous," which said Thomas of Wodehous, it is presumed, must have been some governor, or one in authority, of the English town or garrison. The other pillar shows the same arms and legend, but with a different subject. Information of the discovery has been communicated to Lord Wodehouse, and it is expected that he will give some directions relative to the matter. On another pillar, in the body of the church, a long slab of coffee-colored marble has been found, with a stone in the centre, occupying the place of a niche, while above, below, and around it, the surface of the marble is thickly covered with white roses. Almost every column that has been tried, shows marks of paintings beneath the whitewash, and it is the intention of the authorities to institute a strict examination of the entire edifice. Not the least remarkable are the scrawls on the pillars in old English and court-hand, with charcoal drawings of the galleys and other vessels of the epoch, and the names of the parties who amused themselves in this way, instead of edifying by mass or sermon. The period of the Wodehous emblazonment must have been previous to Agincourt, as the arms of that family at present borne, bear no analogy to those just discovered, and it is known that Henry V., after his victory, gave fresh arms with supporters to one of the Wodehouses who distinguished himself on that day. The white roses also indicate the Lancasterian dynasty. The ecclesiastics here are somewhat sarcastic upon the Vandalism which could seek to deface and conceal ornaments: but the inference is, that it took place at the Reformation, when all the emblems of the old superstition were destroyed; and the speediest way of getting rid of the eyesore and stumbling-block would certainly be a coating of whitewash. The archaiologists, at the head of whom are MM. Derheims and Duffaittel (under the auspices of the Society of Arts, &c.), are very zealous and active on this occasion, and this brief notice of their researches is sent, as anything connected with our former dominion there, cannot but be acceptable to an Englishman.

Wreck of the Royal George.—Another great explosion will take place, weather permitting, on Wednesday, the 5th of August next, about or soon after two o'clock in the afternoon. Red flags will be hoisted in the morning on all the Royal George flotilla, as on former occasions; but should a violent gale of wind render it inexpedient to fire it on that day, it will be put off till the 6th or 7th of August, or till the weather moderates; and each day of delay will require that the explosion shall take place at a later hour, in order to suit the tides.—*Hampshire Telegraph.*

The Nunhead Cemetery.—The cemetery at Nunhead was consecrated on Wednesday morning, with the usual ceremonies, by the Bishop of Winchester, the diocesan. The directors of the London Cemetery Company, to which the cemetery belongs, met his Lordship at Camberwell, at 10 o'clock, and the procession moved on thence to the cemetery. There were present Mr. Kemble, M.P., one of the members for Surrey; Mr. Blount, of Mapledurham; the Rev. Dr. Russell, of the Charterhouse; and many other clergymen, Mr. Wilson, Mr. Wright, &c. The company, after the conclusion of the consecration, were entertained by the directors with an elegant *dejeuner,* under a large tent erected for the occasion. The health of the Bishop of Winchester was drunk by the guests, for which his Lordship returned thanks, and proposed the health of Mr. Kemble, which was given with great cordiality, and for which Mr. Kemble returned thanks. The health of Dr. Russell, who presided as chairman, was also drunk. The cemetery is well laid out over a space of 50 acres, surrounded with an iron railing. The architect is Mr. J. B. Bunning, to whom great praise is due for the taste displayed, and for the plans and models of the chapels about to be erected. The view from the cemetery is very fine, commanding nearly the whole of London, and a great portion of the counties of Kent and Surrey.

Expedition to the Niger.—The expedition to the Niger, which has been contemplated for some time, has now been finally decided upon, and will leave England for Africa when a sufficient complement of men, and the stores required for this service is completed. The expedition will be under the command of Captain Henry Dundas Trotter, of the royal navy; and three of her Majesty's steam-vessels will shortly be commissioned for this purpose by Captain Henry Dundas Trotter, Commander William Allen, and Commander Bird Allen. Printed notices are in course of preparation, and will be immediately issued, requiring petty officers, including artificers of all kinds; well-qualified engineers of the first and second class, and engine-drivers or stokers, and the men who apply, will, in the meantime, be entered in the following vessels, which have been ordered to be prepared for their reception:—the Britannia, at Portsmouth; the Impregnable, at Plymouth; the William and Mary, at Woolwich; and the Redwing, at Liverpool. As an inducement to join the expedition, double pay will be allowed on leaving England.

Walker's Improved Needles.—The Queen has been pleased to command, that the improved needles (made by Walker) shall be called the "Queen's Own." They are "got up" in a very beautiful manner, the labels being excellent profiles of her Majesty and her Royal Consort, in relief, on various colors; they were introduced cotemporary with the new Postage Stamps, with the dulness of which they were much contrasted at the time by the press in general. The chief alterations in the needles are in the eyes and points, usually so much complained of; the latter enter very freely, and the former are very large, and of course, easy to thread; their acknowledged superiority will, no doubt, greatly increase the already large demand for them. Their cost is exactly the same as that of the *common* needles.—*Courier.*

FINE ARTS.

MUSIC IN RUSSIA.

So little is known of the state of art in Russia, beyond the sums of money munificently lavished on individual artists, that the following paper, a translated abstract from two letters addressed by the sprightly composer of 'Le Postillon de Lonjumeau,' to the Editor of *La France Musicale,* can hardly fail to be interesting. M. Adam, it will be remembered,

passed the winter of 1839-40 in St. Petersburg, having been invited there to compose the music of a ballet for Mdlle. Taglioni :—

I shall speak of the art, as cultivated in St. Petersburg, in its four divisions—sacred music, dramatic music, military music, and chamber music. The first carries away the palm, because it is the only one typical of its birth-place, and not imitative of the music of other nations: at least, so far as regards its execution. The Greek church does not admit of the use of instruments. The singers of the Emperor's chapel, therefore, who never sing any other music but that of the services, have arrived at a power of singing unaccompanied, with a justness of intonation which it is impossible to imagine. An inconceivable strangeness is also given to their performance, by the nature of the double bass voices, the extent of which is from the A below the lines to the C above (bass clef), and which, by its lower octave doubling the bass voices of the ordinary register, produces an amazing effect. With us the limit of the bass voice seems to be E flat, below the line, D being an extreme rarity; but whereas all our students labor to push the voice upwards,—sacrificing such pedal tones, that they may be able to sing the modern music, in Russia a few double-bass chest-notes are a fortune; if their possessor be also a good musician, he becomes his Majesty the Emperor's pensioner for life. Alone, these voices would be insupportably heavy, but in combination their effect is miraculous; and never have I been so moved by any orchestral performance as by the vocal services of the Emperor's chapel. The *soprani* are energetic, and there are some agreeable solo voices among the children: the tenors, though far from being as unique as the bass voices, are still very satisfactory. Ivanoff belonged to this chapel, and was sent thence to Italy to complete his musical education, but the unexpected fugue by which he terminated his studies, will probably hinder any other of the pupils from being allowed a like advantage. I wish the music were equal to the singers. Almost all of it dates back to the last century, and is the composition of a certain Bertiensky, who did not want talent or science so much as original invention. The direction of the chapel is intrusted to Colonel Lvoff, an exceedingly clever composer, and a distinguished violinist, of whom I shall again speak.

Dramatic music flourishes less than any other in St. Petersburg: and it is difficult to understand why, when the church has such magnificent voices, and the army such excellent wind instruments, the theatre should have such a poor orchestra, and neither choruses nor singers. There are three theatres—the Great Theatre, devoted to ballet and Russian and German opera; the Theatre Michael, where they play the lighter German comedies and operas, French comedies and vaudevilles; and the Alexandrine Theatre, exclusively devoted to Russian pieces,—all three are allowed an enormous sum by the Emperor—but the Alexandrine Theatre alone pays its expenses. The Great Theatre is one of the finest edifices of its kind in Europe—the *salle* is larger than that of our French Opera;—but Opera has lost all its importance since the arrival of Mdlle. Taglioni; and the ballet, which is got up with imperial magnificence, is the only entertainment which fills this vast theatre. The corps de ballet is numerous—a school for dancers being attached to the theatre, from whence have issued some admirable native artists. I must instance Madame Smirnova and Andrianova. Unluckily, however, "the sex" is not remarkable for its beauty at St. Petersburg, and though MM. Taglioni and Titus may form good dancers, they cannot mould anew the ungracious physiognomies of the practitioners. The orchestra is numerous, but made up of inferior materials, and capable of nothing better than ballet music—it contains, however, an excellent flute and very good oboe, both Russian artists. That of the German Opera is, on the whole, better, but still there is much to be desired in its details. The company is weak, and I can only particularise Breiting, the first tenor, and Versing, the bass, whose magnificent organ deserves to have been better practised. The repertory, as is the case throughout Germany, consists of translated French and Italian operas, and half a dozen German works, including two by Weber and four by Mozart. The Russian opera has not more influence on the public taste, having only the same repertory to another text, and with other singers. Leonof, the first tenor, is only Russian by birth, being the son of Field, the pianist, and having studied in France; he is a good musician, but wants voice. The *prima donna*, too, used to be known at our Opéra Comique, as Mdlle. Verteuil: here, having also been born in Russia, she has taken the name of Soloviova, which, translated, is a sort of diminutive of "*nightingale*:" she has a pleasing voice, and excessive facility, but she is a poor musician, and most unequal singer. Mdlle. Stepanova, a young pupil of the Academy, would have been a good singer, had she studied good models. Petrof, the first bass singer, has a fine voice, but little method—his wife, La Petrova, has a very limited *contralto*, but which she knows how to use with great expression and energy. As the Russian company has only one bass singer, she is obliged to sing such parts as Tamburini's in 'I Puritani,' and, of course, to take the redoubtable duo in unison, in the higher octave. The orchestra of the Russian opera is no better than the German. M. Cavos, who directs it, is a composer and musician of talent, and the eldest son of the distinguished architect who rebuilt the Great Theatre. There is but one national Russian opera, 'All for the Czar,' founded on a simple anecdote of the old wars between Russia and Poland, and the devotion of a serf who exposes his life to save his sovereign. Such a tale was sure to be popular in Russia, and the music of M. Glinka has had as much success as the poem; the work having for some years been played with little intermission. There is, unquestionably, great merit in the musician's share of the work,—skill in form, and care in instrumentation. M. Glinka was resolved to write music which should be neither Italian, French, nor German, and so far he has succeeded; but he has not made his work interesting to any save Russian ears. I never heard any work so soporific—his opera being written in the style of the national melodies, which are almost all in the minor key, and of an undecided and melancholy rhythm. There is not one recitative—only sweet and pensive airs, intermixed from time to time by very well-managed and well-written choruses. This opera is much better executed than any of the translations with which it is alternated. One cause of the scarcity of singers in Russia is, doubtless, the height of the pitch, which is half a tone sharper there than in Paris. Conceive the torture of those unfortunate beings who are compelled to sing parts written for Rubini, Duprez, Falcon! It will be difficult to mitigate this, on account of the resistance always made by the stranger artists who visit Petersburg, and who being chiefly violinists or violoncellists, find great advantage and brilliancy in so exaggerated a diapason.

The number of musical amateurs at St. Petersburg is great: they confine themselves, however, apparently, to three instruments, the piano, the violin, and the violoncello—an amateur player on any wind instrument would be sought for in vain. Thus, the artists who are certain of success in Russia are pianists, violinists, and violoncellists, as the past winter's campaign of Henselt, Vieuxtemps, and Servais, sufficiently testifies. In the first class of amateurs, I must mention the Counts Michael and Matthew Wilheourski,—the first, an amateur composer, some of whose works have been adopted by Paris and Berlin publishers,—and who has written a national opera, which, with retrenchments, would, I am sure, be more successful than that by M. Glinka,—the second, a violoncellist, and the best in St. Petersburg, artists included, with the exception of Servais. At the house of these noblemen, I have heard the quartetts of Mendelssohn, which are scarcely known in France, admirably executed, Vieuxtemps and Colonel Lvoff, alternately taking the first violin, without any extraordinary difference being observable. Colonel Lvoff, too, besides his remarkable performance, is an extremely clever composer. I must speak, too, of the Prince Odoeski, an excellent musician and a good pianist—of the bass voice of the Prince Gregory Wolkonski, of the exquisite tenor of Prince Michael Kotchoubeï, and of the duet between tenor and bass in the brothers Pachkof. This excellence in a pursuit so widely distinct from the profession and position of those exercising it, seems to excite no astonishment in Russia. In France, it is a reproach to a grave and learned person to have cultivated with success an art treated merely as a trifling relaxation—and I recollect well the astonishment excited in some persons by the talent in singing displayed by the celebrated Dr. Orfila. In Russia it is different; a gentleman may speak his three or four languages, and be a good instrumentalist into the bargain, without being treated as a *rara avis*. Life goes so easily with us at Paris—pleasures and dissipations pursue us so incessantly, that it absolutely demands courage to escape them; and those even, who are compelled to labor, are often obliged to exercise strong constraint to procure the requisite leisure. But in Russia, it is necessary to create occupations to get rid of *ennui*. Think of a winter eight months long, where the climate obliges you, perforce, to confine yourselves to apartments in which an artificial heat mimics the spring, and where daylight appears at nine o'clock, to disappear at three! Thus the arts, which with us are an amusement, become there a necessity. Justice, however, must be done to the rare superiority which the Russians have attained—an amateur, who is not of the first class, dare not confess that he knows anything of music. I have said that singing is little cultivated—there is no want of good voices, only of models. The Countess Rossi (ex Sontag), who has for some years been resident at St. Petersburg, could have given a great impulse to this branch of art; but, being newly admitted amongst the aristocracy, her influence has been small or none. There are at St. Petersburg two masters of Italian singing, who are far from being without merit, MM. Rubini and Soliva; but they labor under the disadvantage of not being themselves singers. The greater number of artists are Germans, and, consequently, excellent musicians; but directing the tastes of their pupils towards instrumental rather than vocal music.

The people do not cultivate music, but they love it. The serfs have some rude instruments, on which they accompany themselves, while singing. But I must not forget to speak of the bands of Gipsy singers which I have heard. Their music, made up of a dozen voices, or thereabouts, is the most extravagant thing conceivable. When they begin, their quaint and shrill voices absolutely hurt the ear; but as they become animated, beating their drums and *tearing* their guitars (their only instrument), their wild energy—a positive musical frenzy, augmented by their gestures and their pantomime—takes you by storm, and excites sensations never felt before. I must write of the military music of Russia in another letter.—*Athenæum*.

REPORTS OF SCIENTIFIC MEETINGS

ROYAL SOCIETY.

The following is a list of the papers and communications read before the Society during the session 1839 and 1840.*

Nov. 30, 1839.—Anniversary Meeting.

Dec. 12.—"On the Nerves of the Gravid Uterus." By Robert Lee, M.D., F.R.S.

"Observations made at the Cape of Good Hope, in the year 1838, with Bradley's Zenith Sector, for the Verification of the Amplitude of the Abbé de la Caille's Arc of the Meridian; by order of the Lords Commissioners of the Admiralty." By Thomas Maclear, Esq., M.A., F.R.S., &c. Communicated by Sir John Barrow, Bart. V.P.R.S., &c.

Dec. 19.—"An account of experiments made

* As we are not able to furnish reports of the meetings of this and a few other Societies, we think it advisable, during the summer recess, to occupy this part of our Journal with a list of the papers read at those Societies, as it may prove serviceable for reference. The details will be found in their Transactions and Proceedings.

with the view of ascertaining the possibility of obtaining a Spark before the Circuit of the Voltaic Battery is completed." By J. P. Gassiot, Esq.

Jan. 9, 1840.—"On the Construction and Use of Single Achromatic Eye Pieces, and their Superiority to the Double Eye Pieces of Huyghens." By the Rev. J. B. Reade, M.A., F.R.S.

"Meteorological Observations made between October, 1837, and April, 1839, at Alten, in Finmarken." By Mr. S. H. Thomas, chief mining agent at the Alten Copper Works. Presented to the Royal Society by John R. Crowe, Esq., Her Britanuic Majesty's Consul at Finmarken. Communicated by Major Edward Sabine, R.A.,V.P.R.S.

Jan. 16.—"On Nobili's Plate of Colors; in a letter, from J. P. Gassiot, Esq., addressed to J. W. Lubbock, Esq., V.P., and Treasurer, R.S."

"Geographical position of the Principal Points of the Triangulations of the Californias and of the Mexican Coasts of the Pacific, with the heights of the principal points of that part of the Cordilleras." By the Comte Vincent Piccolomini; in a letter, addressed to Sir John F. W. Herschel, Bart., V.P., R.S.

"Report on the Co operation of the Russian and German Observers in a System of Simultaneous Magnetical Observations." By the Rev. H. Lloyd, F.R.S., in a letter addressed to Sir John F. W. Herschel, Bart., V.P. R.S.

"On Magnetical Observations in Germany, Norway, and Russia." By Major Sabine, R.A., V.P. R.S., in a letter to Baron Von Humboldt, For Mem. R S., dated Oct. 24th, 1839.

Jan. 23.—"On the Structure of Normal and Adventitious Bone." By Alfred Smee, Esq., communicated by P. M. Roget, M.D., Sec. R.S.

"Au Attempt to establish a New and General Notation, applicable to the Doctrine of Life Contingencies" By Peter Hardy, Esq., F.R S.

Jan. 30.—"Observations on Single Vision with two Eyes." By T. Wharton Joues, Esq. Communicated by Richard Owen, Esq., F.R.S.

Feb. 6.—"Observations on theBlood Corpuscules of certain Species of the Genus Cervus." By George Gulliver, Esq, F.R.S., Assistant Surgeon to the Royal Regiment of Horse Guards.

"Meteorological Register kept at Port Arthur, Van Diemen's Land, during the year 1838." By Deputy Assistant Commissary General Lempriere, in south latitude, 43 deg. 9 min. 6 sec., and east longitude, 147 deg. 51 min. 33 sec. Communicated by Capt. Beaufort, R.N., F.R.S.

"Experimental Researches in Electricity, 16th Series." By Michael Faraday, Esq., D.C.L., F.R.S., &c.

Feb. 13.—"Experimental Researches in Electricity, 16th Series." By M. Faraday, Esq.; resumed and concluded.

Feb. 20.—"On the Wet Summer of 1839." By Luke Howard, Esq., F.R.S., &c.

"On the Chemical Action of the Rays of the Solar Spectrum on Preparations of Silver and other substances, both Metallic and Non-metallic, and on some Photographic Processes." By Sir John F. W. Herschel, Bart., V.P. R.S.

The Addresses of Congratulation to Her Majesty the Queen, on the occasion of Her Marriage, and his Royal Highness Prince Albert, of Saxe Coburg and Gotha, were presented, Feb. 19, 1840.

Feb. 27.—"On the Chemical Action of the Rays of the Solar Spectrum on Preparations of Silver and other Substances both Metallic and Non-metallic; and on some Photographic Processes." By Sir John F. W. Herchel, V.P.R.S. &c., was resumed, but not concluded.

The President read the gracious answer returned by His Royal Highness Prince Albert to the Address presented on Feb. 19.

March 5.—Sir John F. W. Herschel's Paper was resumed and concluded.

"Remarks on the Theory of the Dispersion of Light as connected with Polarization." By the Rev. Baden Powell, M.A., F.R.S., and Savilian Professor of Geometry, Oxford.

"Further Particulars of the Fall of the Cold Bokkeveld Meteorite." By Thomas Maclear, Esq., F.R.S., in a letter to Sir J. F. W. Herschel, Bart. K.H.

"An Account of the Shooting Stars of 1095 and 1243." By Sir Francis Palgrave, K.H., F.R.S. &c.

March 12.—"On certain Variations of the mean height of the Barometer, mean temperature and depth of Rain, connected with the Lunar Phases, in the cycle of years from 1815 to 1823." By Luke Howard, Esq., F.R.S.

"On the Theory of the Dark Bands formed in the Solar Spectrum, from partial interception by Transparent Plates." By the Rev. Baden Powell, M.A., F.R.S.

March 19.—"Contributions to Terrestrial Magnetism." By Major Edward Sabine, R.A., V.P.R.S.

"Experimental Researches in Electricity, Seventeenth Series." By Michael Farady, Esq., D.C.L., F.R.S. &c. On the Source of Power in the Voltaic Pile.

(To be Continued.)

URANIAN SOCIETY.

July 7. W. H. White, Esq., V.P., in the chair.

A donation of an extensive and valuable set of mathematical tables relating to the circle, was announced as being received from J. Utting, Esq.

A paper on the "Nebulous Theory of Laplace," by Mr. J. M. Cavalier, was read; the purport of which was to present a collection of facts and probabilities in favor of the theory for the society's investigation. On considering the phenomena of that system of planets known as the solar system, we perceive a harmony pervading, which informs us *that such is not the work of chance*, but the result of ONE GRAND UNIVERSAL LAW, to which common causes are only secondary; a law which is in all, and by all, acting differently as the circumstances by which the patient is surrounded vary, and multiplying its effects as the mediums of communication increase. From this one grand fact, (which being self-evident is universally admitted,) we find no difficulty in concluding, that if a mass of matter were placed in certain circumstances, this law would produce effects in agreement with those circumstances; and, therefore, that if these circumstances were favorable for resolving that mass of which they are attributes into a planetary system, there is sufficient power in the law alluded to for creating sun, planets, and satellites in perfect adaptation with each other, displaying order and design in exact accordance with the notions of the most enlightened intelligence.

From this we *may* elicit the cause of planetary creation, but the *modus operandi* thereof becomes a subject of considerable inquiry and dangerous speculation, and the knowledge of which entirely depends upon the facts from which we make our deductions.

If from operations now going on in the solar system we can perceive any progression which is in universal continuance, we immediately infer, and that most rightly, that the bodies which are affected by this progression, must gradually with that constant progression, be changing their physical conditions to adapt themselves for the different positions they occupy: hence we argue, that inconceivable ages back, the matter of which these bodies are composed was in a very different state to that it now assumes.

If, by any means, we could trace these various changes retrospectively, there is sufficient harmony in the planetary elements now adopted, to give us reason to decide that they were originally one homogeneous mass.*

In adducing the facts and analogous reason we possess, and pointing out how far they allow us in coming to a decision, there is only one error to guard against, namely, in giving too much importance to probabilities, or to admit as certain a deduction, which an equal number of probabilities as gave it would falsify, for it is only where probabilities present us with one deduction, and no more, that such can be entertained.

It is perhaps unnecessary to state, that the system of which our earth forms a planet is no longer considered as the production of a sudden creation, but the result of a continued exertion of certain natural laws, yet unexplained, and that through a period which eludes our conception.

Impressed with this consideration, Laplace directed his attention specially to this subject, and ever after it became his earnest endeavor to deduce from celestial phenomena a theory which might be explanatory of the laws that have produced the sun and its attendant bodies.

By carefully investigating and comparing all the facts that presented themselves he obtained the following assumption:—

That at an inconceivably remote period, the matter which composes our system was one identical mass of nebulous matter, extending far beyond the orbit of URANUS, the centre of which occupied the place of the sun; that by virtue of inherent motion it radiated its vast heat, which, consequently, in course of time, became considerably diminished; cotemporaneous with its diminution of heat, was a contraction of the mass of nebulosity, and as its radius decreased, its *rotary* velocity increased; that the diminution of heat, the decrease of the radius, and the increased velocity of rotation became so considerable in quantity, the nebulous mass was no longer capable of holding its particles together; the result was the formation of a zone of vapor at the extreme surface or circumference of the nebulosity, the extent of which had considerably diminished, in consequence of the previous contraction of the mass: the body being now relieved from the zone thrown off, had an accessiou of rotary velocity, while the zone moved with no greater velocity than when it was part of the nebulosity; this disagreement between the velocities of the mass and zone, caused a comparative condensation of the latter, which eventually became an annulus of condensed vapor; that, by the unequal temperature of the various particles of this annulus, it broke up into fragments, or segments of a circle, which necessarily consolidated themselves into a spheroid, which rotating on its axis, and performing a revolution in an orbit, whose space the ring had previously described, constituted the first planet of the solar system.*

(To be Continued.)

* Homogenous only as regards the general character of the mass.

* A consolidation of this nature must have been the inevitable consequence, because there being no other body having a greater or an equal affinity for these fragments than they had for each other, their mutual attraction must have preponderated.

THE THEATRES.

"See that the players be well used."—*Hamlet.*
"Nothing extenuate, nor aught set down in malice."—*Othello.*

The Metropolitan theatres are now the very *acmé* of dullness. The season has arrived when all who can afford it, flee coastwards, religiously bent on the enjoyment of pure sea-breezes, and a wholesome atmosphere. The consequence is, that novelties, worthy of being so called, in the theatrical world, are at present of rare occurrence.

DRURY LANE.—The *Concerts d'Eté* are now in such high estimation, that crowded houses are observable night after night. The programme exhibits a selection varied so as to suit all tastes, and the audience is as select as it is numerous. The profound silence and attentiou with which some of the finer portions of the music are listened to, give, as we observed last week, strong evidence of an improved and improving musical taste amongst the English.

We advise all who have not yet heard Herr FRISCH, the celebrated flutist, to visit the theatre without loss of time. His delicacy of expression,

and rapidity of execution, we have never before heard equalled by any performer in this country. The solo performances of Horr Koenig, too, upon the cornet-à-piston, are no less wonderful. His age is under 25 years! Lord Burghersh's new "*Battle Sinfonia*" has been repeated every evening during the week, and regularly *encored*. The orchestra, on this occasion, is aided by a military band of 34 extra performers, making a total of 141 persons. The effect is such, that the walls of Old Drury ring again with tumults of applause and admiration.

Mr. Eliason takes his benefit on Monday; on which occasion, a number of novelties will be brought forward that will strengthen his claim upon the public. He has catered so liberally for their entertainment throughout the season, that we will answer for his reaping the reward of merit, in the form of "a bumper." We need hardly add how sincerely we wish him so desirable a result.

Haymarket.—Mr. Charles Kean terminates his present engagement on Monday. Mr. Power takes his "benefit," and with it, his departure to America, to night. Mr. Macready will hereafter reign supreme in tragedy at this establishment. Webster, with commendable zeal, has made new engagements to carry on his summer campaign. Harrison and Miss Rainforth are retained for the operatic department, and will appear together in the *Beggars' Opera*, which is in rehearsal, with new scenery, dresses, and decorations. We hear that Mr. Webster has kindly devoted the services of his establishment, on Wednesday, to Mrs. Hughes, relict of the late worthy veteran of Drury Lane. On this occasion, Charles Kean will "attempt" the part of *Shylock*, and Miss Ellen Tree will appear as *Portia*. We need hardly say, how efficient a representation she will be found of the character. Mrs. Hughes, it will be remembered, was formerly a Miss E. Jones, and a decided favorite at the Royal theatres. We remember her perfectly well. In the bills, we observe an announcement of a Mr. David Rees, from Dublin, who is to appear here shortly. Nobody seems to know any thing about him, but as he has not been ushered in by the usual disgusting quackery, we hope he will prove a desirable acquisition to the company. Unobtrusive merit is sure to make its way.

English Opera.—This little company continues to flourish, and the entertainments are wisely varied. Miss Cooper and Miss M. Glover are the presiding divinities here, and Brougham is reckoned the giant of fun. Momus has it all his own way at present; and all who enter with long faces have them quickly changed into short ones. *Life in the Clouds*, or *Vita in Nubibus*, as Brougham *will* call it, is, to use the language of the bill, "a tremend-*u*-ous hit!"

Surrey.—We reported proceedings here last week, and as we have nothing further to add to what we then said, we let this week's play-bill speak for itself. It is thus headed:—"Audiences *literally* crowded to the ceiling, nightly flock to witness *Jane of the Hatchet*, the most successful and gorgeous spectacle ever produced. The evolutions of 100 Female Warriors, grand entry of the Amazonian army, simultaneous rising on the rocks, and defeat of the soldiery, are electric effects, and meet with repeated cheers. Upwards of 20,000 persons have witnessed it." We never dispute the word of "Mr. Davidge, of the Surrey Theatre," and therefore give the above as "gospel."

Astley's.—The *Siege of Troy*, and the gigantic War-horse, still carry all before them. The representation is every way classic, *so* classic, that we were thrown into violent convulsions the other evening, whilst hearing one of the Trojans exclaim, as he strode across the stage, "*Timeo Danoes, vel dona ferentes!*" His exit was marked with the fire of true genius, and we may safely pronounce that he will, one day, be a great man. We err, if he does not consider himself one now! We shall not, however, hand down his name to posterity just yet.

New Strand.—Mr. Selby has taken this unfortunate establishment, in conjunction with Signor Frangopulos, with a view to re-establish it in public favor. A number of favorite burlettas have been played during the week, and several novelties are promised to be forthcoming. Our droll friend, Attwood, appears on Monday in that laughter-moving burletta, *Behind the Scenes*. His personation of the principal character would cause a Stoic to resolve himself into a "guffaw."

Victoria.—We fear the proceedings here are more amusing than profitable, though some popular pieces have been brought forward. On Monday evening, there was a grand *Scena*, about 11 o'clock; an awful pause of half an hour having elapsed between the third and concluding piece. The gentlemen of the orchestra were "*non sunt inventi*," when wanted; and several of the performers had such awfully-long countenances, and, moreover, such deficient memories, that we could not help fancying there was "something rotten in the state of Denmark." It appears they were waiting the arrival of "Count *Salari*—no!" It turned out, on his advent at the eleventh hour, that his pocket had been picked *in transitu*.

Fanny Stirling, we are happy to say, will appear at the Haymarket in September, where she is engaged for the whole season. Webster has evinced much good sense in this engagement, for Mrs. Stirling is a universal favorite. James Wallack will appear about the same time.

Brighton.—It has often struck us as being a remarkable circumstance, that at so fashionable a place as Brighton, the theatre should be so barbarously conducted as it has been for so many years past. Ranking as it does as a second London, we should have supposed some public-spirited individual, with a long purse, would have come forward in support of the Drama's best interests, and engaged a "Company" that would have proved powerfully attractive. Such, however, is *not* the case; and *now*, ten in the boxes, and six in the pit, is a well-filled house!

We observe an account of the re-opening of the theatre, on Saturday last, in our worthy contemporary, the *Brighton Guardian*, which we subjoin. It gives powerful evidence of the "signs of the times:"

—"Our theatre re-opened on Saturday evening last, after a recess of several months, during which the lessee, Mr. Charles Hill, promised when the house closed in February last, that he would bestir himself to get together a really efficient company, which might be worthy of the patronage of a discerning public; but judging from what we have seen, the pledge so given has been most flagrantly disregarded. Instead of a company as effective even as heretofore at the commencement of the season,—and this is not saying very much either for the liberality or judgment of the manager,—we commence this year with what, in point of quality, is equal only to the company at the fag-end of a season, when, by the gradual withdrawal of the principal members, those in the rear step forward from sheer necessity into the front rank, and from playing second or third-rate business fret their hour in the principal walks of the profession. For instance, Mrs. Walton a very respectable actress in second class characters, and generally very useful in a company, is again the leading lady, as she was towards the close of the last campaign; and with the exception of Mrs. Jephson, who takes the "old women" and plays them with considerable ability, and Mr. Saville for second light comedy, there is not a single line of business in the drama which is in hands to which the term "respectable" would not be a highly flattered application. To a male singer they do not even pretend, as we learnt on Saturday, when all the stanzas in the national anthem were *executed* by ladies, Miss Stoker coming last, and by her screeching convincing all who heard her that nothing but dire necessity could have induced a manager to have entrusted such a task to her. A Mr. Cathcart, whom a contemporary, perhaps in ignorance, but with great truth, announced for the "*heavy business*," is, it seems, to be the leading gentleman; but if his *Shylock* offers a fair test of his ability as a tragedian, we must pronounce him *wholly unworthy* of the post of honor to which he has been advanced. Mr. Walton, as spiritless, as indolent, and as slovenly as ever, goes on for low comedy, which he robs of its fun and its vivacity; and Mrs. Edward Knight, the poor remains of the once celebrated Miss Povey, is the singing lady, having introduced "Bid me Discourse" into the character of *Jessica*, for no other purpose that we can imagine except to distress her old admirers, and to apprise them betimes what sad havoc age had made on her once agreeable but now cracked voice. Such are the prominent features of Mr. Charles Hill's *company*. It is true that the bills announced Mrs. David Lee, a clever and elegant actress; but doubtless for reasons which are sufficiently obvious, Mrs. Lee has accepted an engagement elsewhere, and will not appear on the Brighton boards. Mr. Thom, too, was not only announced as Leader of the Orchestra, but his name absolutely continues to figure away as "Leader of the Band" among the pompous announcements of "Stage Manager," "Conductor and Arranger," "Prompter," and "Acting Manager and Treasurer," at the foot of the bills, though he has not been near the theatre, and is not at this time even in the country; and to aggravate the wretched poverty of talent so painfully and palpably discernible, Mr. Hill has put the management into commission, as it were, and does not condescend either by his own presence, or by the presence of his wife, Mrs. Hill, to compensate by their own personal exertions for the want of theatrical ability in those whom they have engaged.

We need hardly add, that the *Merchant of Venice* went off on Saturday with great flatness. Mrs. Walton is altogether incapable of sustaining so arduous a character as *Portia*; and *Shylock* in the hands of Mr. Cathcart was stript of *all* interest. As a melo-dramatic actor, this gentleman may perhaps win some applause from the noisy gods; but he will never become a favorite with any part of the house as the representative of Shakspeare's heroes.

On Monday, Mr. Harper (an American actor of the *Jim Crow* school) made his first appearance. He *dances* the nigger more vigorously than Mr. T. D. Rice, but is not so humorous as that gentleman. The performance is, however, one of extreme grossness and vulgarity, and more calculated for a booth at a fair than a Theatre Royal in a town of fashionable resort. While Mr. Harper's engagement lasts, we shall have no inducement to revisit the theatre. This is one of the vices of the *star* system,—it puts the legitimate drama aside in favor of the many monstrosities which have contributed not a little to degrade the stage, and to bring its professors into bad odor and disrepute."

Birmingham Musical Festival.—Among the novelties to be brought forward at our Musical Festival, says the *Birmingham Advertiser*, is a composition of Fasch, who was the founder of a Choral Society in Berlin, called the *Sing Academie*, about half a century ago, which consists of nearly five hundred members, including all the highest families in Berlin who have voices capable of singing. In learning and Science, Fasch is considered equal to Sabastian Bach, and all his best compositions were written for that society. As there are no instruments used, he composed for four choirs, or sixteen vocal parts to make a full score; and the performance of his music by that body is said to produce the finest vocal effects. We have pleasure in stating, that the committee have been able to procure a copy of one of his pieces, which will be sustained at the ensuing festival by upwards of two hundred and sixty voices.

Paris.—Taglioni's Benefit.—Taglioni had a benefit at the *Academie Royale* on Saturday. This benefit has been to her productive of more money, more compliments, and more popularity, than any

of the money she has "taken" in Paris. A great portion of the pit was converted into stalls, to which, "if dressed," ladies were eligible at the modest price of 20 francs each. This fixed sum, so large for Paris, was not only paid by all who applied in time for stalls, but even by the set of scamps and ruffians who, to the disgrace of the police, are permitted to forestall all the best places in the theatres whenever the performances are more than usually inviting, and to charge whatever their consciences suggest, or their dupes are satisfied to pay. (For example, 120 francs each were paid for stalls for the first representation of the *Huguenots*.)

The house was filled by one of the most brilliant audiences it ever boasted, including the King of the Belgians, the Duke and Duchess of Orleans, the Princess Clementine, the Dukes of Aumale and Montpensier, and the Duke of Wurtemburg, and their suites (so numerous as to occupy six carriages), and who arrived shortly after eight o'clock—that is, just in time for the second act of the ballet of the *Fille de Danube*, in which Taglioni surpassed herself, and to which she added, with rapturous effect, the *Pas de Naïades*. The Queen of the Belgians remained at St. Cloud with her august parents because of her so recent confinement.

The triumph of the fair *beneficiare* was reserved, however, for the *bal masque* from the opera of *Gustave*, in which she went beyond all her previous efforts, particularly in the new *pas de deux* with Madame Noblet, introduced by them into the *Sylphide*. The audience applauded this to the echo, although it was observable that they were impatient, and that they kept a portion of their breath and their strength for the *Gitana*. On her entry, in a beautifully-conceived costume (received as perfect Spanish), a murmur of admiration was heard, which presently swelled into enthusiastic cheering. The sound of the castanettes achieved the rest; for, during the dance, a sort of delirium carried away the spectators. "She was" as one of the great critics of the day afterwards expressed it in the *Foyer*, "noble, graceful, and playful by turns. It was neither the fandago, nor the cachuca, nor the jaléo, but all together," and was accordingly encored.

At the conclusion of this dance, a shower of bouquets, garlands, and crowns of flowers, fell upon and literally overwhelmed her, and after the fall of the curtain she was called for, and compelled to endure a renewal of the most thundering applause with which a theatrical performer was ever yet rewarded. Taglioni was about to leave Paris for Doberan. "All Mecklenburg is in an ecstacy of expectation," one of the French newspapers says, "for she is to dance three or four nights, commencing with the 4th of August. She is to reach Berlin on the 11th, and is to be in St. Petersburg on the 22d."

ADVERTISEMENTS.

HOLMES'S PATENT, SEALED NOV. 1839, FOR IMPROVEMENTS IN THE CONSTRUCTION OF IRON SHIPS, BOATS, AND OTHER VESSELS, also in Means for Preventing the same from Foundering, also in the Application of the same Improvements or parts thereof to other vessels.

"All persons who examine this patent, must admit Mr Holmes to have fully established the principles insisted on in his report to the East India Committee, in 1838, of the practicability of building iron ships without limits to size, and on the indispensable necessity of the adoption, not only of much larger ships than had been contemplated, but that it was equally indispensable, in point of profit, that they should be built of iron, and by the adoption of his improvements a great reduction in the first cost of wear and tear would be effected. Many parts of these improvements are, however, equally applicable to wood ships, as regards safety to the passengers; and wherever they are adopted, we cannot conceive any case or circumstance in which a ship can be placed in danger. In the fullest sense of the word, they become life-boats, without waste of room, or extra cost."—*From the "Inventors' Advocate," July 4.*

Applications for licenses to be made to Mr. HELPS, 21, Cornhill, London, or to Mr. HOLMES, Civil Engineer and Naval Architect, 5, Cannon-row, Westminster, where Plans and Specifications are prepared, with every practical detail for the Builder's Contracts for every Class of Iron Vessels.

COLLEGE for CIVIL ENGINEERS.—NOTICE IS HEREBY GIVEN, that the College has been removed from the temporary premises at Kentish Town to very spacious and airy freehold premises at Putney, the purchase of which has been effected by the Council; and that the Students are expected to reassemble on Thursday the 13th day of August next.

By order of the Council,
J. E. B. CURTIS, Secretary.

Every information as to terms, mode of admission, and the general regulations of the College, may be obtained by application to the Secretary, at the Office.

Office, 9, Villiers-street, Strand.
July 22, 1840.

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The chief object of this Company is the recovery of sunken vessels and cargoes, for which purpose certain most important inventions have lately been made and patented, and the exclusive ownership secured to the Company; the principle of these inventions is simple, the efficacy certain, and to secure success, the only thing necessary is to provide for the due application; with this view, experiments upon a most extensive scale have been instituted, under the superintendence of the Directors of this Company, and the result of such experiments has proved the great value of these inventions.

The facts established in the Report of the Committee of the House of Commons, relative to shipwreck, No. 567, page 3, printed 15th August, 1836, sufficiently prove the immense scope for the operations of a Salvage Company, it appearing therein that during a period of six years, to which that Committee limited their investigations, no less than 2,905 vessels were wrecked or missing; and the amount of losses thereby, was estimated at £14,515,000: and it will be recollected that in the month of January, 1839, nine vessels were stranded in the entrances to the Mersey alone, the value of whose cargoes exceeded £1,000,000.

The Directors have satisfactory proof, that much of the property referred to by the Committee of the House of Commons rests under circumstances favorable for its recovery, being specie, metals, and other imperishable goods, to which the means at the disposal of the Company are certainly applicable, and the continual addition to this accumulation by the disasters daily reported from the coast, leaves no room for doubt that the operations of the Company will prove as extensively beneficial as they are important.

Prospectuses and further information, may be had at the temporary offices of the Company, 14, Bucklersbury, where working models of their apparatus may be seen.

Applications for shares must be made, addressed to the secretary as above, prior to the 1st of August next.

Mining Journal Office, 37, New Broad-street, City, 27th June, 1840.

NEW WORK ON THE IRON TRADE.—The Number of the MINING REVIEW this day published, contains the Sixth Part of the Paper on the IRON TRADE, by Harry Scrivenor, Esq.—this work will be completed in Twelve Monthly Parts, and so arranged as to form a separate volume at the end of the year; in addition to which the MINING REVIEW contains—A Paper on the Establishment of a School of Mines—On the Ventilation of Mines, by Samuel Moyle, Esq., C.E.—On the Preparation of China-Clay, by W. J. Henwood, Esq., F.R.S., &c.—On Blasting Limestone Rock, being an Account of Blasting the White Limestone in the Country of Antrim, Ireland, by William Bald, F.R.S.E., M.R.I.A.—On the Applicability of Peat to Manufacturing Iron—Parliamentary Returns of the Imports and Exports of Copper, Lead, and Tin, for the year ending 5th January, 1840—Scientific Bodies, &c.—The MINING REVIEW is published at the office, as above, on the 1st of each month, price Sixpence.

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TO PATENTEES.

PATENTEES and OTHERS are respectfully informed, that Advertisements for any of the London or Provincial Papers, through the office of Mr. S. Deacon, 3, Walbrook, will meet prompt attention. The London papers, the Inventors' Advocate, Repertory of Arts, Mechanics' Magazine, and the Provincial Papers from every county, may be seen. An Index kept to Advertisements for Heirs, &c.

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THE

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A WEEKLY BRITISH AND FOREIGN MISCELLANY OF

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STATISTICS OF STEAM-ENGINES.

The statistics of steam-engines in any country, constitute at present the thermometer of its power of production, and of its manufacturing riches. What nation is it that, at the present day, carries the produce of its manufactures to all the markets in the world? It is England, which, by the power of steam, has been able to create thousands of facilities. What nation is behind all others, and is the most impoverished? Spain or Italy; which, notwithstanding the richuess of their soil, the superiority of their climate, and the advantagos of their position, cannot compete with other nations who have the power of steam to assist them. It is, in short, not only tho power of production of a country, of which steam-engines constitute their thermometer, hut also of its maritime and military power; for there is little doubt that the ocean will henceforth be the theatre of every great war.

The following is an account of the progressive increase of steam-engines in France of late years, and the actual number she possessed on the 1st of January, 1839, which is the latest date to which the official documents have been brought down:—

STEAM-ENGINES ON LAND.

Before 1816, the number of steam-engines in France was inconsiderable. From that time it hegan to increase very sensibly, as appears by the following table:—

	HIGH PRESSURE ENGINES		LOW PRESSURE.		TOTAL.	
	number.	power.*	number.	power.	number.	power.
In 1820	47	976	41	440	88	1,416
1836	502	9,813	1,247	13,598	1,749	23,411
1837	532	10,386	1,437	15,801	1,969	26,187
1838	550	10,734	1,575	18,168	2,125	28,902

* In estimating the power of steam-engines in this table, the power of one horse is considered to be equal to raise a weight of 65 kilogrammes, one metre per second. This power is, in fact, much greater than that exerted by one horse.

The average power of the low-pressure engines is equal to 19 horses; those of the high-pressure engines, 11; and those of high and low pressure combined, 13. In 1838, the branches of industry that employed the greatest number of steam-engines were as follows:—

Spinning	575
Mines	360
Making and refining of sugar	210
Forges	132
Manufactories of machines	105
Raising of water	90
Weaving cloth	78
Dressing cloths	76
Flour mills	75
Sawing mills	59
Manufacture of calicoes	52
Oil-mills	46

In 1838, the number of locomotives was 48, and their united power, 1,225 horses.

Eight-ninths of the steam-engines and the apparatus connected with them, working on land, were manufactured in France.

STEAM-BOILERS.

In 1820, there were 74 in France; in 1836, there were 1,219; in 1837, 1,480; in 1838, 1,568. Nine-tenths of them were made in France. Of the 1,568, in 1838, 916 were high-pressure, and 652 low-pressure.

STEAM-BOATS.

This last subdivision being at present of the greatest importance, we shall give all the documents that indicate the progress and condition of steam navigation, on the 1st of January, 1839, in France, England, and the United States. To commence with France:—

	Vessels.	Engines.	Power.	Tonnage.
In 1833	75	90	2,633	38,000
1834	82	92	2,863	23,000
1835	100	118	3,863	121,000
1836	105	122	4,148	161,000
1837	124	150	5,408	199,000
1838	160	207	7,493	275,000

Of the 207 engines in 1838, there were 140 high-pressure, and 67 low-pressure engines. The low-pressure engines had an average power of 39 horses; the high-pressure engines, of 30 horses. The 160 vessels consisted, of 84 engaged in the transport of passengers; 42 in the conveyance of passengers and merchandise conjointly; 11 in towing; 15 in towing and conveying passengers; 7 in towing and conveying merchandise; and one in towing and conveying at the same time passengers and merchandise.

The following table exhibits the progress and state of steam navigation in England:—

	Vessels.		Vessels
In 1814	6	In 1834	463
1820	56	1835	554
1830	350	1836	610
1833	386	1840	810

The 810 steam vessels England possessed on the 1st of January, 1840, had a total power of 63,250 horses, and a tonnage of 175,840.

In the United States in 1839, there were 800 steam vessels, with a power of 100,318 horses, and a tonnage of 155,473. We do not possess any documents relating to the general state of the steam navigation of the United States, prior to 1839. On the rivers in the west and the south-west, where, in 1811, sailing ships only were employed, and where in 1834 the number of steam-boats employed was 254, there are at present 400. On the river Ohio alone, there have been counted 413 steam vessels of all kinds passing along the canal of Louisville and Portland, without reckoning those that plied at the two extremities of the river without entering the canal. In 1831, the number of passeugers on the Louisville canal was estimated at only 406; in 1837, the number was raised to 1,501. The United States have few steam-boats for long voyages, and they have no war steamers. There are, however, 13 steam-ships that might be placed at the service of the government, to be fitted as ships of war, or for the conveyance of troops and ammunition.

This exposé is a grievous one for France. It shows clearly that steam navigation—that new power which will greatly influence the manufacturing and political interests of nations—has scarcely made any progress in France, whilst in England and the United States it has assumed an extraordinary degree of power. Many causes have produced this state of things. Among the chief must be mentioned the condition of navigation in all departments—the river navigation, the coasting, and sea voyages—a grievous condition as everybody knows, which must be attributed to the high tolls, to the price of wood and iron, to the rate of discount and insurance, and to the insufficient protection that has been afforded to French commerce in different parts of the globe. As navigation in sailing ships was in a state of general depression when steam navigation was invented and introduced, it is easy to understand why it has not been much encouraged in France. It is not when any branch of industry is suffering

that improvements are essayed; that is done only in prosperous times. This is the reason why steam navigation has made so little progress in France.

The *Moniteur Industriel*, from which journal the preceding statements are taken, finds great fault with the French government for discouraging the manufacture of marine steam-engines in France, by giving orders to English engineers for the engines for the Transatlantic steam ships. The writer observes, that steam is destined to produce revolutions in the world, and that it is pure folly to depend upon other nations for the supply of the most powerful instruments of war that man ever invented. He concludes, by boasting of the superiority of French ingenuity and skill. Their engineers, he says, have more intelligence and are more scientific than those of England or America; and if they were only properly encouraged, we should see France "when she is enabled to exert all her energies, and put forth all her power, in manufactures as well as on the field of battle, the first nation of the world."

CHEMICAL CHANGES OF THE BLOOD.

A Paper of great importance was read at the sitting of the French Academy of Sciences, on the 26th of last month, on the Composition of the Blood. The author of this paper is M. Andral, a surgeon of eminence, who has paid great attention to the science of chemistry, and who has proceeded on a new plan, and opened new views in his analyses of human blood. In his investigations he was assisted by M. Gavarey, and the plan they proceeded upon was that pointed out by M. Dumas in his lectures on physiology.

It must be stated, in the first instance, that the blood is composed of several primary elements, consisting of water, albumen, fibrin, sanguineous globules, and a great many salts. These elements are in different states of combination; for instance, it is now well known that the albumen and the fibrin are in a state of solution in the blood; that is, they are not in the form of solid bodies so long as the blood continues in its original condition; the globules, on the contrary, are small bodies of very complex nature, that are suspended in the fluid of the blood. For a long time it was thought that the fibrin, that remarkable element of the blood, which becomes solid and constitutes the "clot," after the blood has been withdrawn from the vital influence, was in a solid state, and formed part of the sanguineous globules. The globules and the fibrin, it was thought, were formed of the same elements, and that the coagulation of the blood was produced by the combination of all the globules of the blood at the time the coagulation took place.

But it has been since clearly shown, by the experiments of Professor Muller, that fibrin is, like the albumen, in a state of solution in the blood, that it is independent of the globules, and that the globules and the fibrin are two distinct parts of the blood; this fact is proved by conclusive experiments. Thus, after having removed all the fibrin from the blood, the globules are found entire as before, and in separating the globules by a filter, the fibrin coagulates in the filtered liquid, when entirely deprived of globules.

There still remains unexplained this remarkable fact of the coagulation of the blood, owing to the solidification of its fibrin, as soon as the blood has been drawn from the vessels of the body, and left to itself. Every one knows that the blood in such a case separates into a solid portion that is called the "clot," and into a water or *serum*. This fact is altogether inexplicable in the present state of the science of physiology. It is not owing to cold nor to rest, for by keeping the blood in motion artificially, and by maintaining its former temperature, the coagulation is neither diminished nor retarded. All that can be said is, that the blood becomes dead when it is withdrawn from the vital action. The clot of blood is always red, though fibrin is white; but it is colored by the presence of the globules, to which the coloring matter of the blood belongs, and which sticks to the fibrin as it coagulates. The red globules of the blood, then, form part of the clot, but only as an adjunct, in the same manner as water forms part of a sponge in which it is absorbed. The blood must be considered as a liquid holding in solution albumen, fibrin, and numerous salts, and containing in a state of suspension little red solid globules.

Fibrin is an essential element of the blood, though it constitutes but a very small portion of it; so small, indeed, that it does not form more than the five-thousandth part of the whole; and yet the most important properties of the blood seem to be owing to this minute proportion of fibrin. In fact, it appears from the experiments of M. Majendie, for example, that the blood of an animal may be injected, without any injurious effect, into the veins of another animal of a very different species provided the blood is deprived of its fibrin. The bad effects of the transfusion of blood in these cases do not depend, therefore, on the size, or the form of the sanguineous globules, as had been hitherto imagined, but on the different nature of the fibrin, that principle of which only the five-thousandth part enters into the composition of the whole mass.

It becomes an interesting question, to consider whether the different elements of the blood undergo alteration in different diseases, and if they do, what is the nature of those changes? This forms the subject of the investigation of Andral and Gavarey. M. Lecanse had previously made similar analyses, and the results of his analyses are nearly the same as those of Messrs. Andral and Gavarey; but he proceeded upon the former erroneous theory, which supposes the fibrin as constituting part of the globules, therefore it is requisite to make an allowance for that error in his experiments before the correct result can be obtained. The researches of Messrs. Andral and Gavarey were also made in a much greater number of diseases, and the results of their experiments are more clear, determinate, and precise.

M. Andral has distinguished four classes of disease in connection with the changes in the proportion of the elements of the blood. In the first, there is an increase of the quantity of fibrin, almost to the extent of double the quantity that exists in a healthy state. This class of diseases comprises inflammations, properly so called, such as rheumatism, pulmonary affections, &c., and even a certain stage of consumption; and it is remarkable that the proportion of fibrin does not diminish, notwithstanding repeated bleedings, so long as the state of inflammation continues. This fact is very curious, and its discovery is entirely owing to the observations of Messrs. Andral and Gavarey; but we regret that they did not at the same time direct their attention to the chemical change that takes place in the fibrin as the quantity of blood is diminished. Not only does the blood in such cases become more liquid, but it loses some of its vital properties, that is to say, it coagulates much sooner after it has been taken from the veins. After the fourth or fifth time of bleeding, the blood on becoming impoverished coagulates in ten or twelve minutes, whilst usually it does not coagulate in less than fifteen or eighteen minutes. Though the proportion of fibrin increases in purely inflammatory diseases, the quantity of globules seems to undergo no change.

In the second class of disease, comprising fevers, congestions, &c., the quantity of fibrin is generally diminished, though not constantly so. It is deserving of notice, too, as a circumstance that almost invariably attends these complaints, that the globules increase. Bleeding, however, has the effect of quickly diminishing the increased quantity of globules.

M. Andral remarks especially the decrease in the quantity of globules in a disease constituting part of the third class. In green sickness, the diminution in the proportion of the globules is truly surprising; it extends to less than the fourth part of the quantity that there is in the healthy state of the blood. What is also remarkable is, that the temperature of the body remains the same, in opposition to the theory of Messrs. Prevost and Dumas, respecting the relation between the temperature of the body, and the quantity of globules in the blood. It has been observed that the quantity of globules increases, after administering iron in those cases.

In some diseases, constituting the fourth class, such, for example, as diabetes, the proportion of albumen in the *serum* of the blood diminishes in a very marked degree. This is the natural consequence of the loss of albumen by the urine.

Messrs. Andral and Gavarey might have added that the quantity of albumen also appears to diminish rapidly in proportion to the quantity of blood taken away in every kind of disease, for the specific gravity of the blood is decidedly diminished at every bleeding, and the density of the fluid does not depend either on the globules or on the fibrin.

The conclusion of M. Andral's investigations and remarks was to be read at the next sitting of the Academy. The learned reporter of the proceedings in the *Journal des Debats*, from which Journal the foregoing is translated, observes, that though these researches deserve the highest eulogium, he fears lest, in the ardent pursuit of science, these experimentalists may injure their patients by too frequent blood-lettings.

VOYAGE TO THE PACIFIC ARCHIPELAGOS.

The French frigate *Venus*, under the command of Captain Abel du Petit-Thouars, has recently returned from a voyage in the Pacific, where she has been visiting most of the groups of islands in that sea. The captain is about to publish an account of his voyage, an extract from which, giving a lively account of his visit to the Marquesas, is published in the *Journal des Debats* of Friday. The whole of the extract occupies too much space for us to give it entire; we therefore select the account of his visit to the isle of Christina:—

"A canoe from the shore of the isle of Christina came to the ship, bringing in her an Englishman named Robinson. He had inhabited that island from his infancy. He was tattoed, and had all the habits of his adopted country. He came to offer to pilot us. I had previously heard of him, and of another Englishman named Tom Collins, and knew that I might trust them. Collins was not long in showing himself, and he represented to Robinson the difficulty of anchoring the ship in the bay of Madre de Dios. Robinson was persuaded to that opinion, and I proceeded under their directions to the bay of Amanoa, where we cast anchor. I learnt that Collins lived near the creek before which we were anchored, which fact clearly explained to us the cause of his preference for this bay.

We had scarcely cast anchor before the king came to us in a canoe, accompanied by two other chiefs and, a child, his son, whom he wished to leave as hostage. The king was called Yotuati. His height was colossal, and he was stout in proportion. He is nearly black, and was naked, and tattoed from head to foot. His countenance is open and expressive of goodness; on looking at him we could scarcely imagine that he was a chief of the Anthropophagi. It must be said in his praise, also, that he is the only man on his island who

refuses to take part in their cannibal festivals. His black majesty did not appear embarrassed, for he had been accustomed to such visits. What appeared most to attract his attention was the large size of the ship, its numerous crew, and the imposing appearance of its batteries of cannons. The chiefs who accompanied his majesty were also of great size and were tattoed.

I announced to the king, before his departure, that I was going to salute him with four cannons. Nothing could flatter him more. He did not disguise the pleasure he felt at this mark of respect, and he expressed a wish to see the cannon fired. I told him that it was not customary to fire until after the departure of the person saluted. After thinking some time, he begged me not to adhere rigidly to precedent in this instance, but to let two cannons be fired before he left the ship, and the two others after: this I readily agreed to. The prime minister then requested to be permitted to fire the cannons, and his request was also granted.

The king afterwards came on board every day that the ship remained; he scarcely left me till the frigate sailed. He came to breakfast; returned to the shore when it was over, and reappeared exactly at dinner time. There was nothing ridiculous nor awkward in his manners. He was not importunate; he examined things with attention, and seemed anxious to imitate us, and to do nothing that might displease. At first it appeared to me strange to have seated at my table two colossal figures (for the prime minister was as constant a visitor as the king) quite naked, marked from head to foot in the most curious patterns, which nevertheless were not wanting in symmetry nor taste. It is truly said that tattooing hides nakedness; the singularity of the figures attracts the attention and produces the appearance of dress. It can scarcely be imagined how soon we became accustomed to this strange clothing.

I exchanged names with the king. He was called Du Petit-Thouars, and I was Youtati. From that moment he could refuse me nothing. I was made master of the island, especially of his valley, and more particularly of Madame Youtati; who next day came with the king to remind me that I was Youtati; I received her very politely, but I did not take advantage of the magnanimity of so generous a prince. I endeavored to entertain their majesties, and showed them all over the frigate. In passing the oven, where they were taking out the bread, the queen asked for a loaf, which she carried away under her arm. The king on this visit of state came in his best costume. He had his hair tied in a tuft, he had an immense cap, the ends of which nearly touched the ground, and a mantle made of red swan-skin was placed on his shoulders, being fastened to his neck. He was entirely clothed, which gave him a remarkably dignified appearance. The queen had fastened her hair under a kind of fine net, which had the appearance of gauze. She was muffled up in a robe of green merino, which she had received from our French missionaries, and above it she wore a mantle; her arms, feet, and hands were naked, and were elegantly tattoed. The women of this archipelago are almost always either lying down or squatting, and seem to have a difficulty in standing. Before they begin to walk, it is difficult to say whether they will go on all fours, or on their two feet.

On this visit, I gave the King a sabre with a gilded scabbard, with which he seemed greatly pleased. The belt, which was made at Paris, and of the ordinary size, could not be employed in the usual manner; it would have required two added together, to have compassed the person of his Majesty.

In the few presents that I had brought to bestow, queens had been forgotten, therefore I was a good deal at a loss what to give her Majesty. Nevertheless, as the ladies of the Pacific Ocean are not yet very difficult to please, I thought that a red checked cotton curtain might make a splendid mantle, and most certainly I was not mistaken. An Indian cachemere could not have made the Princess more happy.

As the King appeared to be very well disposed, I told him that for the purpose of establishing more intimate connections with us, I would leave him two missionaries, who would learn to speak his language, and would teach his son French. He appeared very anxious that the missionaries should remain, and even offered a part of his palace for their accommodation, until they had a house of their own. He gave a piece of ground large enough for their house and for a garden. The reverend fathers, Devaux and Borgella, whose intention it was to settle on some of the Marquesas, could not have had a more favorable opportunity. They were anxious to take advantage of these good offers, and on the 6th of August they landed on the island, and went to occupy that part of the king's house which he had appropriated to them. Before my departure, the king gave them another piece of land with a house on it, that was sufficiently large for their use, and in tolerable condition. The king's palace is a large cabin, about twenty metres long, and between three and four wide. It is situated near the shore, under some large trees, which make it shady and cool. In the inside, and at each extremity of the cabin, there is an elevated space, about a foot from the ground, exclusively reserved for the king. The village consists of thirty or forty huts, and the population amounts to about 150 or 200, among whom were a dozen Europeans, English, Spaniards, and French.

The king showed me a uniform with epaulettes, being that of a captain in the English navy, which he said had been given to him by Captain Bruce. He told me he kept it for going on board English ships, and that he wanted one to enable him to appear in proper costume on board French ships of war. I could not resist so powerful an argument, and I accoutred him from head to foot. I never in all my life saw any one more happy. He stalked about with great dignity, looked at himself in the glass, admired himself, and laughed heartily. Youtati is to all appearance about fifty years of age; his vanity was that of a child; nothing can give a better idea of the character of these savages than their excessive pleasure and pride on such an occasion. On our departure from the island, the king did not leave the frigate till it was under sail; and when he was obliged to leave, he cried like a child.

EXPIRED PATENTS.

PATENTS THAT HAVE EXPIRED DURING THE WEEK ENDING AUGUST 1, 1840.

ENGLAND.

WILLIAM DAVIDSON, of Gallowgate, in the county of Glasgow, surgeon and druggist, *for a process or processes for bleaching or whitening bees'-wax, myrtle-wax, and animal tallow*, Aug. 1.

THOMAS JOHN KNOWLYS, of Trinity College, Oxford, Esq., and WILLIAM DEUSBURY, of Bousal, in the county of Derby, color manufacturer, for *certain improvements in tanning*, Aug. 1.

COUNT ADOLPHE EUGENE DE ROSEN, of Princes-street, Cavendish-square, in the county of Middlesex, in consequence of a communication made to him by a certain foreigner residing abroad, for *a new engine for communicating power to answer the purposes of a steam-engine*, Aug. 1.

JOSEPH BROWNE WILKS, of Tandridge-hall, in the county of Surrey, Esq., for *improvements in producing steam for steam-engines and other purposes*, Aug. 2.

LEMUEL WILLIAM WRIGHT, of the Borough-road, engineer, for *improvements in the construction of trucks or carriages applicable to useful purposes*, Aug. 2.

SPECIFICATIONS.

A LIST OF SPECIFICATIONS ENTERED AT THE ENROLLMENT OFFICE, UP TO THE WEEK ENDING AUGUST 1, 1840.

(Continued from page 68.)

ENGLAND.

JOHN WHITEHOUSE, West Bromwich, Stafford, iron-master, *improvements in preparing and rolling iron, and other metals, or metallic alloys, for the manufacture of certain articles of commerce*, July 27.—The claims are for the mode of forming the machine for producing spoon iron, as well as the form of the different sorts of spoon iron.

Heretofore, spoons have been made by hand labor, in order to form the tang of sufficient substance to hold on to the bowl; some spoons are made of sheet iron. But in this improvement, the iron is passed through rollers, that have cavities or depressed parts on their peripheries, in order that the blanks cut off may have the increased thickness where the tang joins the bowl.

HENRY CURZON, of the Borough of Kidderminster, Worcester, machinist, *improvement in steam-engines*, July 28.—This improvement is for the mode of working steam expansively, and for combining three or more cylinders to work a common axis shaft in such manner that the piston of the various cylinders precede each other in distance, equal to a third or fourth of the stroke when the steam is cut off.

High-pressure engines have been worked to advantage at the mines in Cornwall, &c., where a continuous and regular motion is not requisite. But in steam-boats, this irregular movement is highly prejudicial, which the inventor proposes to remedy by means of his improvement.

The steam being at 45lbs. to the square inch, enters one cylinder, and when its piston is at one-third the stroke, the steam escapes to the second cylinder, and forces the piston to the second third of the stroke; hence, it passes to the third cylinder, and completes the rotation of the axis or shaft.

WILLIAM MOTTERSHAW FORMAN, of Shepshead, Leicester, frame-smith, *certain improvements in stocking-frames, and machinery used in frame-work knitting*, July 27.—The inventor claims the use of "catches" and "fallers" as a substitute for the "old jack;" and as a substitute for the "old lead," in which "the sinkers" were held, he employs "dividers." Lastly, he claims the new position of the "slur cock" acting upon the said catches, as well as the use of various cam levers and machinery not now used in stocking-frames, by which the thread is made to perform the same motion with the needles as heretofore.

It would be impossible to explain the structure of this machine without the aid of drawings. The catches hold the fallers until the "slur cock," in traversing the machine, presses them at the moment the thread is thrown across the needles, when the catches leave their hold, and the fallers drop to place the thread between the needles; a cam on the main shaft presses the lever connected with a bar that holds the dividing places, by which means they are made to press the sinkers attached thereto down between each of the fallers, in order to form double the number of loops.

Other levers, with friction rollers at their ends, are made to work by means of cams on the main shaft, whereby the "fallers" and "sinkers" are made to rise again to their former position, so as to repeat their action on the thread while across the needles.

WILLIAM PETTITT, of Bradwell, Bucks, *a communicating apparatus to be applied to railroad carriages*, July 30.—A tube passes under each carriage, and a cord is placed through the tubes to connect the whole of the carriages with the engine, where a

circular box is situated, within which is an upright tube holding two horizontal wheels one above the other. The lower wheel is fastened to the cord, in order that the engineer or conductor may at any given signal turn the rod connected with the upright tube, and thereby open the valve above the boiler, thus retarding the velocity of the engine, and at the same time causing, by the action of the cord along the train of carriages, a number of colored flags or lamps as required to spring up as a signal of danger. Thus, by the like rule, should any one of the train of carriages get off the rail, the cord raises the valve of the boiler, sounds the whistle, and the flags or lamps of distress are made to rise.

Moses Poole, Lincoln's Inn, *improvements in pumps*, July 30.—First claim is for the mode of constructing buckets of lift pumps.

Secondly, for the mode of constructing valves for force and lift pumps.

This improvement simply consists in the use of a conical vessel perforated with holes; a leather conical cup is placed within it, and the piston rod holds the bottom of this cup to the vessel or bucket; thus, in the down stroke of the piston, the leather will collapse by the pressure of the water passing through the perforated holes of the conical bucket, and the upstroke will cause the leather to expand over the holes, and thereby raise the water. The valve works on the same principle, only it is held stationary in the cylinder.

William Cubitt, Gray's Inn-lane, builder, *certain improvements in roofing*, July 30.—This improvement consists in the plan of cutting boards, and afterwards placing them to form a roofing.

Presuming that boards of one and a half inches thick and seven inches across, are cut by a circular saw in a sianting direction, or within an angle of 90, towards the centre, the result will be, that two leaves are formed, one with a ridge on the face, and the other channelled.

The ordinary rafters are dispensed with, and principal rafters tied and stayed as usual, are only made use of, on to which are placed "the purlins." These ridged and channelled leaves, or boards, are arranged in succession so as to form a roof; whereby the material is greatly economised, and the rain is made to pass down the channelled centre. But, in order to catch and carry off any rain that may pass through the imperfect joints, fillets of wood, falling at one end, are let into the undersides of the "purlins."

William Brockedon, Queen's-square, Middlesex, *improvements in the means of retaining fluids of bottles*, July 31.—The inventor claims the mode of employing "capsules" or discs of metal formed by a die.

This capsule or disc has a groove or rising studs, whereby the wire from the neck of the bottle may be made to pass over; hence the cork is perfectly secured and held down. The like improvement is used to hold down the woven, or felted wool, that is employed as a substitute for cork; which improvement forms the subject of a former patent.

William Pontifex, Shoe-lane, copper-smith, *an improvement in treating fluids containing coloring matter, to obtain the coloring matter therefrom*, July 27.—This improvement is for concentrating the coloring matter contained in fluids, and required for manufacturing purposes, by applying heat to, and thereby evaporating or partially evaporating the said fluids in vacuo, whereby is obtained a highly concentrated coloring extract, or dye-coloring powder, without any injury to the color from carbonization, or other damage inevitably occasioned by the application of heat as heretofore.

A solution of logwood or other coloring matter is placed in an ordinary vacuum pan, where heat passes under during the exhausting process—which occasions a rapid evaporation, and until the liquid assumes a viscid state, when it is allowed to settle, and then the sediment is poured off to dry; or this hyper-saturation of color is rendered applicable to use, by being brayed in a mortar.

ENTERED AT THE ROLLS CHAPEL OFFICE, UP TO THE WEEK ENDING AUGUST 1, 1840.

(*Continued from Page* 68.)

ENGLAND.

Edward Halliley, of Leeds, York, cloth manufacturer, *improvements in machinery for raising pile on woollen and other fabrics*, July 20.—First claim, is the mode or method of cross-raising the pile on woollen or other cloths by means of the endless belts, carrying the wire-cards, teasels, or other raising surfaces, and particularly the mode or method of fixing the teasels, wire-cards, glass or emery cloths, or other raising surfaces on the endless belts, together with the other necessary parts for conducting the piece of cloth through the machine, and adjusting and regulating the action of the teasels, wire-cards, or other raising surface upon the cloth.

Secondly, as regards the combined machine, he claims the application and use of the said endless belts of raising surfaces, for cross raising the pile, and the connection and combination of the same with the gig teasel cylinder, furnished with other suitable raising surfaces, for raising the pile lengthwise of the piece, and particularly the manner of fixing and arranging the wire-cards or other surfaces on the cylinder, and the giving to the said cylinder an alternating longitudinal movement.

Lastly, the general arrangement and construction of the said combined machine.

There are two rollers placed about the centre of the cloth, round which the endless belts with the boxes of teasels or wire-cards pass, and are carried laterally over a large roller placed on each side of the cloth.

The inner rollers are capable of adjustment through the agency of racks and pinions, whereby the raising surface of the cloth can be regulated.

The wire-card cylinder has a lateral alternating or shogging movement, given to it by means of a grooved cam, and around the cylinder are placed the boxes of wire-card or teasels, in coiled lines or in a helical direction, or curve, from the middle part of the cylinder towards the ends, whereby these raising surfaces will be prevented from striking on to or acting upon the same part of the cloth twice in one revolution of the cylinder, and thereby prevent streaks or marks in the cloth, and, in fact, will operate more like a workman when dressing by hand or "slipeing" with the "nelly" or hand-frame of wire-cards or teasels.

Alexander Hett, Gower-street, Bedford-square, *certain improvements in the arrangement and construction of fire-grates or fire-places, applicable to various purposes*, July 23.—This improvement consists in a peculiar disposition of the several parts of the fire-place, whereby the fuel is economised, and the temperature of a room or chamber is raised to a considerable height or degree of warmth without employing a very large fire. This object is effected by warming a stratum of air with the heat that would otherwise escape up the chimney.

The grate has false or hollow sides and back; the under part or hearth is also made hollow. A pipe, in communication with the external atmosphere, conveys cold air into the hollow space before mentioned; this air being brought in contact with the heated sides and back of the grate, becomes warmed (but not burnt), and in this state is allowed to pass through a conducting pipe, and escape into the room, through an aperture situated at any convenient part of the room; or the warm air may be conveyed through a pipe into a room above, or otherwise contiguous.

In another arrangement, the cold air is warmed by the smoke and heat, which escapes up the chimney. In this case, the cold air is made to traverse a series of bent pipes, extended across the upper part of the grate, and placed in about the same situation as the register plate of a common register stove. The smoke and heated vapor, in proceeding from the fire to the chimney, pass between these bent pipes, and thereby raise the temperature of the air contained within them, which is conveyed from the pipes in the same manner as in the former arrangement.

Lastly, for the purpose of burning anthracite coal, the draft to support combustion passes directly through the fire, and through an oblong hole, made in the back plate of the grate, where a pipe for conducting the smoke into the chimney is fastened by a flange; which pipe passes through the hollow back, and thereby warms the air contained therein. The draft through the fire is regulated by a damper, which may be used to extinguish the fire.

Caarles Rowley, of Birmingham, Warwick' stamper and piercer, and Benjamin Wakefield, of Bordesley, in the parish of Aston, Warwick, machinist, *improved methods of cutting out, stamping or forming and piercing buttons, shells and backs for buttons, washers or other articles from metal plate, with improved machinery and tools for those purposes*, July 21.—The first improvement is for the improved machinery that stamps the metal at one operation, instead of by two or three distinct operations as heretofore. A lever above is so connected with a lever below, that the one action will cause both the levers to bring their tool or punch at the same time on to the piece of metal.

The action of the punch below, is caused by the falling of a weight, which cuts out and stamps the button at one blow. There is also improved machinery and tools, which operate by a continuous rotary motion, and after cutting out a piece of metal plate by a descending action of a punch tool, transfer the piece so cut to another tool, which pierces and stamps or forms the article by pressure from below upwards, at the same time that the punching tool is ascending again in preparation for cutting out another piece; by the same machine, the sheet of metal is presented in order to be cut out and pierced—also, by the aid of grooved rollers, the edges of round pieces of metal or button discs are turned.

NOTICE.

In accordance with the determination expressed in our 26th Number, of giving one month's clear notice to Inventors, before publishing their specifications, we hereby inform the following Patentees, that their specifications will be published in the "Inventors' Advocate" of Sept. 12. Each party will receive, in addition, a *private* communication to the same effect.

John Silvester, Great Russell-street, engineer, due Sept. 3.
Joseph Shore, Birmingham, merchant, due Sept. 3.
James Horne, Clapham Common, due Sept. 3.
Joseph C. Daniell, Limpley Stoke, Wilts, due Sept. 3.
John Rangeley, Camberwell, due Sept. 3.
William Craigg, Glasgow, engineer, and William D. Sharp, of Stanley, Perthshire, engineer, due Sept. 3.
Joseph Norion, of High Bridge Mill, York, manufacturer of fancy cloths, and George Collier, of Kelmanthorpe, York, mechanic, due Sept. 4.
Joecph Bower, of Hunslet, near Leeds, soda ash manufacturer, due Sept. 4.
Charles Alex. Petterin, Leicester-square, due Sept. 4.

FOREIGN CORRESPONDENCE.

BELGIUM.

The Belgian Commissioners of Inquiry into trade and manufactures are accompanied in their progress by short-hand writers, for the purpose of reporting the evidence at the conferences with the

manufacturers who are called as witnesses. A deputation from the commission left Antwerp last week for England, for the purpose of visiting the manufactories for spinning flax by machinery. They will remain in England three weeks.

A company has been formed in Belgium, under the sanction of the Royal authority, for establishing manufactories for making machinery. The object of the company is to construct boilers, steam-engines, and everything connected with the mechanical arts.

It is stated, in a letter from Valenciennes, that the railroad from Brussels to the frontier of France, near Valenciennes, is proceeding very rapidly. The entire branch from Brussels to Hal, has been finished some time; that from Hal to Tubise was opened in May last; these two branches measure about five leagues. Five other branches have been laid down, and the workmen are now busily engaged at all points of the line. These different branches will, therefore, soon be united. By the end of the present year, it is expected that the Belgian railroad to the French frontier will be completed.

The Directors of the works of the railroad, through the valley of Vesdre, have, in consequence of accidents arising from the blasting of the works, taken precautions to guard persons visiting the works from danger. A red flag is now elevated on a high pole before an explosion takes place, and a bell is also rung. In addition to these precautions, a quantity of faggots are to be placed before the mine, in order to confine the range of the pieces of rock blown away.

Some thermometrical observations have been published in a Liege paper, for the purpose of showing that when the carriages on the railroad are in rapid motion, the current of air diminishes the temperature 4 deg. centigrade, that in the excavations the diminution is 5 deg., and that in the tunnel of Cumptich the thermometer falls 10 deg. These statements are, however, discredited by the *Emancipation*. They are, that Journal observes, of the same character as the famous report of M. Arago against railroads, who asserted that the conveyance of passengers by railway would produce a frightful mortality, owing to the inflammation of the lungs that would be produced by passing through the tunnels.

It appears by the annual catalogue of the Royal Library of Brussels, that the increase of printed books from the 1st July, 1838, to the 30th Sept., 1839, that is, during fifteen months, was 8,331 volumes. Supposing this to be considered as an indication of the future increase, and there is every reason to think that the number will go on augmenting, the increase at the end of half a century will be 333,600 volumes for printed books alone. As to manuscripts, there was increase in 1838, of 73 volumes, and in 1839, of 24.

The society of pigeon fanciers of Brussels, had fifteen pigeons taken to Orleans, a distance of 90 leagues, where they were liberated on Monday, the 20th ult., at seven o'clock in the morning. The first prize was gained the same day, at twenty-eight minutes past one o'clock in the afternoon, by a pigeon belonging to Mr. Charles Decker, which arrived at that hour at Brussels; the second and third arrived at half-past one and twenty-four minutes to two. Eight pigeons returned to their dovecots on the same day; and thirteen had returned by Wednesday, the 22d. The first pigeon must have flown at the rate of 40 miles an hour for the whole distance.

GERMANY.

THE GERMAN UNION.

The *Commerce* announces, that the Prussian Government had concluded a commercial treaty with the free town of Bremen, in the name of the Association of German Customs; that it was signed on July 6, 1840; and might be considered as a new extension of the German Commercial League. The treaty came into operation on the 1st instant.

HOLLAND.

"The Treaty of Commerce between France and Holland," says the *Courrier Français*, "has been just signed. It opens the ports of Alsace on the Rhine to colonial produce, and gives to French colonies another market,—that of Holland, which is the entrepôt of the German States."

TRANSATLANTIC STEAMERS.

Boston, June 15.—The arrival of the first of the Steam Mail Company's packets has produced the greatest excitement in this port. It entered the harbour on the 3d, having a mail from England, and about 30 passengers from Halifax. Nothing could exceed the cordiality of the reception given to the ship by the citizens of Boston. Almost the whole population hurried down to the wharfs on each side of the harbour; salutes were fired from guns placed on the shore, and from the revenue cutter lying here. Bands of music in that vessel, and in the United States line-of-battle ship Columbus, played at intervals "God save the Queen;" and on these, as well as on all other vessels in the harbour, and on the various public buildings and signal-posts, the English flag was hoisted jointly with the American colors. The city authorities went on board to welcome Mr. Cunard, jun., and Captain Douglas, the commander of the Unicorn. On the following days many thousand people from the city and neighborhood crossed the harbour to East Boston, where the Unicorn lay moored beside the wharf, built expressly for the accommodation of the company's vessels at the expense of the East Boston Company, who, in common with the citizens at large, have evinced the most liberal disposition towards this enterprise from its commencement. On Friday, the 5th, the corporation of Boston gave a public dinner at Faneuil-hall (the usual scene of the city festivities) to Mr. Cunard, Captain Douglas, all the foreign Consuls and Vice Consuls, and between 400 and 500 of the principal inhabitants. The greatest harmony prevailed on the occasion, and the feeling shown towards Great Britain is in the highest degree cordial. Indeed, in this part of the union old recollections are so far reviving, that there is a marked distinction between the British and any other foreign nation, and it only requires prudence in both Governments for the new and old Englanders to go on together as amicably as their ancestors did, and at present, as far as outward appearances are to be trusted, there is every prospect of their doing so. The increased facility now given to our communication with the mother country by the establishment of the steamers, will go a great way towards promoting this desirable end. In bringing the two countries closer together, it leads to the formation of new ties and new interests, which are among the chief incentives of peace.

IMPROVEMENTS OF THE METROPOLIS.

We see by the Bill brought into the House of Commons for improving the metropolis (No. 2), entitled "A Bill to enable her Majesty's Commissioners of Woods, Forests, Land Revenues, Works and Buildings, to make a new street from Coventry-street, Piccadilly, to Long-acre, and for making and completing other improvements in the metropolis," that it is intended to make the following alterations:—One street is intended to be commenced from or near to the east end of Coventry-street, Piccadilly, and to extend from thence to the west end of Long-acre; another is intended to commence from the north side of Long-acre, opposite Bow-street, and to run from thence in or nearly in a north-west direction to Charlotte-street, Bloomsbury; another to commence from the east end of Oxford-street, and to run from thence in or nearly in a direct line therewith eastward into Holborn, at or near the south end of Southampton-street, Bloomsbury; and another is intended to commence from or near to the London Docks, and to run from thence into Leman-street, and from thence in a north-west direction, nearly in a direct line with Leman-street, to the west front of Spitalfields Church. Moreover, it is proposed by the Bill to appropriate £25,000 out of moneys to be borrowed by the Commissioners of Woods and Forests, to assist the Coporation of London in completing the new street which has been begun from Holborn-bridge to Clerkenwell-green; £30,000 towards making a broad line of street between Southwark and Westminster-bridges, on the south side of the Thames, to be carried on to London-bridge, and provide a ready means of communication between the terminus of the Kent and Sussex Railways, and all the west end of the metropolis, including also the termini of the two great South and Western Railways; and a sum, not yet named, to make and complete a spacious and convenient communication between the Houses of Parliament and Buckingham Palace, passing through a district in the City of Westminster which is now very insalubrious, by reason of the want of a sufficient drainage, and for other causes, which would be thereby removed. All these are great and necessary works, and after the late descriptions supplied by Dr. Southwood Smith and others, of the condition of these several parts of the metropolis, of the terrible diseases which continually prevail in them, spreading mephitic contagion to the adjoining regions, they will meet, we should suppose, universal approbation. The great street to be made at the east end of the metropolis, from London Docks to Spitalfields Church, will pass through one of the most neglected, ill-drained, and, we believe, unhealthy parts of the metropolis, and be a noble improvement. The same may be said of the streets which will unite Long-acre to Charlotte-street, and Oxford-street to Holborn, running right through the worst part of St. Giles's. A broad street to connect London, Southwark, and Westminster Bridges, on the south side of the Thames, is also much wanted, and will be of great advantage in carrying off a portion of the immense traffic which passes along the main line of streets north of the Thames, besides draining and opening a densely crowded neighborhood. All these new lines which penetrate places now blocked up by masses of houses built in a disorderly fashion, will tend to promote a circulation of air, and contribute to the health as well as beauty of the metropolis. Most of them have long been recommended, which makes it the more creditable to those who have now undertaken to complete them.

The whole sum to be appropriated to the several purposes is £300,000, and this cost is to be paid by the produce of the tax on wines and coals imported into the Port of London, which is to be continued for four years.

A BILL FOR REGULATING RAILWAYS,

[AS AMENDED BY THE COMMITTEE, AND ON RECOMMITMENT.]

No railway to be opened without notice to the board of trade.—Whereas it is expedient for the safety of the public to provide for the due supervision of railways; be it therefore enacted, by the Queen's most

excellent Majesty, by and with the advice and consent of the lords spiritual and temporal, and commons, in this present Parliament assembled, and by the authority of the same, that after two months from the passing of this Act no railway or portion of any railway shall be opened for the public conveyance of passengers or goods until the expiration of one calendar month after notice in writing of the intention of opening the same shall have been given, by the Company to whom such railway shall belong, to the lords of the committee of her Majesty's privy council appointed for trade and foreign plantations.

Clause E.—*Penalty for opening Railways without notice.*—And be it enacted, that if any railway, or portion of any railway, shall be opened without due notice as aforesaid, the Company to whom such railway shall belong, shall forfeit to her Majesty the sum of twenty pounds for every day during which the same shall continue open, until the expiration of one calendar month after the Company shall have given the like notice as is herein-before required before the opening of the railway; and any such penalty may be recovered in any of her Majesty's courts of record.

Clause F.—*Returns to be made by Railway Companies.*—And be it enacted, that the lords of the said committee may order and direct every Railway Company to make up and deliver returns, according to a form to be provided by the lords of the said committee, of the aggregate traffic in passengers, according to the several classes, and of the aggregate traffic in cattle and goods, on the said railway, as well as of all accidents which may occur thereon attended with personal injury, and also of all tolls, rates, and charges levied on passengers, cattle, and goods; and if the returns herein specified shall not be delivered within thirty days after the same shall have been required, every such Company shall forfeit to her Majesty the sum of twenty pounds for every day during which the said Company shall wilfully neglect to deliver the same; and every such penalty may be recovered in any of her Majesty's court of record: provided always, that such returns shall be required in like manner and at the same time from all the said companies, unless the lords of the said committee shall specially exempt any of the said Companies, and shall enter the grounds of such exemption in the minutes of their proceedings.

Clause G.—*Penalty for making false returns.*—And be it enacted, that every officer of any Company who shall wilfully make any false return to the lords of the said committee shall be deemed guilty of a misdemeanor.

Board of trade may appoint persons to inspect railways.—And be it enacted, that it shall be lawful for the lords of the said committee, if and when they shall think fit, to authorise any proper person or persons to inspect any railway; and it shall be lawful for every person so authorised, at all reasonable times, upon producing his authority, if required, to enter upon and examine the said railway, and the stations, works, and buildings, and the engines and carriages belonging thereto.

Penalty on persons obstructing inspector.—And be it enacted, that every person wilfully obstructing any person, duly authorised as aforesaid, in the execution of his duty, shall, on conviction before a justice of the peace having jurisdiction in the place where the offence shall have been committed, forfeit and pay for every such offence any sum not exceeding ten pounds; and on default of payment of any penalty so adjudged, immediately, or within such times as the said justice of the peace shall appoint, the same justice, or any other justice having jurisdiction in the place where the offender shall be or reside, may commit the offender to prison for any period not exceeding three calendar months; such commitment to be determined on payment of the amount of the penalty; and every such penalty shall be returned to the next ensuing court of quarter sessions in the usual manner.

Copies of existing bye-laws to be laid before board of trade.—And whereas many Railway Companies are or may hereafter be empowered by Act of parliament to make bye-laws orders, rules, or regulations, and to impose penalties for the enforcement thereof upon persons other than the servants of the said Companies; and it is expedient that such powers should be under proper control; be it enacted, that true copies of all such bye-laws, orders, rules, and regulations made under any such powers by every such Company before the passing of this Act, certified in such manner as the lords of the said committee shall from time to time direct, shall, within two calendar months after the passing of this Act, be laid before the lords of the said committee; and that every such bye-law, order, or regulation not so laid before the lords of the said committee within the aforesaid period, shall, from and after that period, cease to have any force or effect, saving in so far as any penalty may have been then already incurred under the same.

No future bye-laws to be valid till two calendar months after they have been laid before the board of trade.—And be it enacted, that no such bye-law, order, rule or regulation made under any such power, and which shall not be in force at the time of the passing of this Act, and no order, rule, or regulation annulling any such existing bye-law, rule, order or regulation which shall be made after the passing of this Act, shall have any force, until two calendar months after a true copy of such bye-law, order, rule, or regulation, certified as aforesaid, shall have been laid before the lords of the said committee, unless the lords of the said committee shall before such period signify their approbation thereof.

Board of trade may disallow bye-laws.—And be it enacted, that it shall be lawful for the lords of the said committee, at any time either before or after any bye-law, order, rule, or regulation shall have been laid before them as aforesaid shall have come into operation, to notify to the Company who shall have made the same, their disallowance thereof; and in case the same shall be in force at the time of such disallowance, the time at which the same shall cease to be in force; and no bye-law, order, rule, or regulation which shall be so disallowed shall have any force or effect whatsoever; or, if it shall be in force at the time of such disallowance, it shall cease to have any force or effect at the time limited in the notice of such disallowance, saving in so far as any penalty may have been then already incurred under the same.

Provisions of Railway Acts requiring confirmation of bye-laws repealed.—And be it enacted, that so much of every clause, provision, and enactment in any Act of Parliament heretofore passed, as may require the approval or concurrence of any justice of the peace or other person or persons other than members of the said Companies to give validity to any bye-laws, rules, or regulations made by any such Company, shall be repealed.

Board of trade may direct prosecutions to enforce provisions of Railway Acts.—And be it enacted, that whenever it shall appear to the lords of the said committee that any of the provisions of the several Acts of Parliament regulating any of the said Companies, of the provisions of this Act, have not been complied with on the part of any of the said Companies, or any of their officers, and that it would be for the public advantage that the due performance of the same should be enforced, the lords of the said committee shall certify the same to her Majesty's Attorney-General for England or Ireland, or to the Lord Advocate of Scotland, as the case may require; and thereupon the said Attorney-General or Lord Advocate shall, by information or by action, bill, plaint, suit at law or in equity, or other legal proceeding, as the case may require, proceed to recover such penalties and forfeitures, or otherwise to enforce the due performance of the said provisions by such means as any person aggrieved by such non compliance, or otherwise authorised to sue for such penalties, might employ under the provisions of the said Acts: provided always, that no such certificate as aforesaid shall be given by the lords of the said committee until twenty-one days after they shall have given notice of their intention to give the same to the Company against or in relation to whom they shall intend to give the same.

Prosecutions to be under sanction of the board of trade, and within two years after the offence.—And be it enacted, that no legal proceedings shall be commenced under the authority of the lords of the said committee against any railway Company for any offence against this Act, or any of the several Acts of Parliament relating to railways, except upon such certificate of the lords of the said committee, as aforesaid, and within one year after such offence shall have been committed.

Clause A.—*Provision for the punishment of servants of Railway Companies guilty of misconduct.*—And be it enacted, that it shall be lawful for any officer or agent of any Railway Company, or for any special constable duly appointed, and all such persons as they may call to their assistance, to seize and detain any engine-driver, guard, porter, or other servant in the employ of such company, who shall be found drunk while employed upon the railway, or commit any offence against any of the bye-laws, rules, or regulations of such Company, or shall wilfully, maliciously, or negligently do, or omit to do, any act whereby the life or limb of any person passing along or being upon the railway belonging to such Company, or the works thereof respectively, shall be or might be injured or endangered, or whereby the passage of any of the engines, carriages or trains of the said Company shall be or might be obstructed or impeded, and to convey such engine-driver, guard, porter, or other servant so offending, or any person counselling, aiding, or assisting in such offence, with all convenient despatch, before some justice of the peace for the place within which such offence shall be committed, without any other warraut or authority than this Act; and every such person so offending, and every person counselling, aiding, or assisting therein, as aforesaid, shall, when convicted before such justice as aforesaid (who is hereby authorised and required upon complaint to him made upon oath, without information in writing, to take cognizance thereof, and to act summarily in the premises), in the discretion of such justice, be imprisoned with or without hard labor for any term not exceeding two calendar months, or in the like discretion of such justice shall for every such offence forfeit to her Majesty any sum not exceeding ten pounds, and in default of payment thereof shall be imprisoned with or without hard labor, as aforesaid, for such period not exceeding two calendar months as such justice shall appoint, such commitment to be determined on payment of the amount of the penalty; and every such penalty shall be returned to the next ensuing court of quarter sessions in the usual manner.

Clause B.—*Provision for punishment of persons obstructing railway.*—And be it enacted, that from and after the passing of this Act, every person who shall wilfully do, or cause to be done, any thing in such manner as to obstruct any engine or carriage using any railway, or to endanger the safety of persons conveyed in or upon the same, or shall aid or assist therein, shall be guilty of a misdemeanor, and being convicted thereof shall be liable, at the discretion of the court before which he shall have been convicted, to be imprisoned with or without hard labor for any term not exceeding two years.

Clause C.—*Board of trade to determine disputes as to junctions of branch railways in certain cases.*—And whereas many Railway Companies are bound by the provisions of the Acts of Parliament by which they are incorporated or regulated, to make, at the expense of the owner or occupier of lands adjoining the railway, openings in the ledges or flanches thereof, (except at certain places on such railway in the said Acts specified), for effecting communications between such railway and any collateral or branch railway, to be laid down over such lands, and any disagreement or difference which shall arise as to the proper places for making any such openings in the ledges or flanches is by such Acts directed to be referred to the decision of any two justices of the peace, within their respective jurisdictions: and whereas it is expedient that so much of every clause, provision, and enactment in any Act of Parliament heretofore passed as gives to any justice or justices the power of hearing or de-

ciding upon any such disagreement or difference as to the proper places for any such openings in the ledges or flanches of any railway should be repealed; be it therefore enacted, that so much of every such clause, provision, and enactment as aforesaid shall be repealed.

Clause D.—And be it enacted, that in case any disagreement or difference shall arise between any such owner or occupier or other persons, and any railway Company, as to the proper places for any such openings in the ledges or flanches of any railway (except at such places as aforesaid) for the purpose of such communication, then the same shall be left to the decision of the lords of the said committee, who are hereby empowered to hear and determine the same in such way as they shall think fit, and their determination shall be binding on all parties.

Communications to board of trade to be left at their office.—Communications by board of trade, how to be authenticated.—What shall be good service on Railway Company.—And be it enacted, that all notices, returns, and other documents required by this Act to be given to or laid before the lords of the said committee, shall be delivered at or sent by the post to the office of the lords of the said committee; and all notices, appointments, requisitions, certificates, or other documents in writing, signed by one of the secretaries of the said committee, or by some officer appointed for that purpose by the lords of the said committee, and purporting to be made by the lords of the said committee, shall for the purpose of this Act be deemed to have been made by the lords of the said committee; and service of the same upon any one or more of the Directors of any Railway Company, or on the secretary or clerk of the said Company, or by leaving the same with the clerk or officer at one of the stations belonging to the said Company, shall be deemed good service upon the said Company.

Meaning of words "Railway" and "Company."—And be it enacted, that wherever the word "railway" is used in this Act, it shall be construed to extend to all railways constructed under the powers of any Act of Parliament, and intended for the conveyance of passengers in or upon carriages drawn or impelled by the power of steam, or by any other mechanical power; and wherever the word "Company" is used in this Act, it shall be construed to extend to and include the proprietors for the time being of any such railway, whether a body corporate or individuals, and their lessees, executors, administrators, and assigns, unless the subject or context be repugnant to such construction.

Act may be repealed this session.—And be it enacted, that this Act may be amended and repealed by any Act to be passed in the present session of Parliament.

RAILWAY INTELLIGENCE,

DOMESTIC AND FOREIGN.

Great Western Railway.—The amount of passenger duty now paid by this Company is at the rate of £20,000 a year.

Midland Counties Railway.—The only merchandise carried at present is between Rottingham, Derby, and Leicester, and a portion from Rottingham to London, which will continue to be sent over the Birmingham and Derby Railway from Derby, until the arrangements at Rugby with the London and Birmingham and Midland Counties Railway Companies are completed.

Junction of the Liverpool and Leeds Railways.—We understand that the two companies have at length agreed as to the terms of completing this junction, the Leeds company bringing their line from St. George's Road to the river side near Hunt's Bank, and the Manchester and Liverpool company extending their line to the other side of the river; the bridge connecting the two to be erected at their joint expense.—*Liverpool Times.*

Thames Haven Railway.—In a former number, a correspondent stated that the Thames Haven Company was about to be proceeded with under the able engineering assistance of the Messrs. Stephenson. On inquiry we find such to be the case, and that some six or seven new directors are about immediately to be introduced into the board, all residents in the city of London. We expect therefore soon to see this line pushing on its works with renovated strength and renewed vigor.—*Railway Magazine.*

The Queen Dowager's Trip on the Railway—Extraordinary Speed.—On the recent occasion of the return of the Queen Dowager from Lancaster, a special train was provided for the conveyance of her Majesty and suite, from Lancaster to Parkside, by the Lancaster and Preston and North Union Railway Companies, and thence to Stafford, being the nearest point to Alton Towers, the seat of the Earl of Shrewsbury, which was her Majesty's destination, by the Grand Junction Railway Company. The train, consisting of three railway carriages, one of which had been handsomely fitted up by the London and Birmingham Company for her Majesty's use, and five private carriages on trucks, making eight in all,

Started from Lancaster, at.....10h. 12m., a. m.
Arrived at Preston Station.....11h. 15m.
Stopped there.....13m.
And on the Viaduct over the Ribble Valley..... 6m.

Time at Preston .....19m.
Arrived at Parkside.....12h. 11m.,

where it was attached to an engine of the Grand Junction Railway.

The latter part of the journey—viz., from Newton junction to Stafford, a distance of fifty-four miles, was performed, exclusive of a stoppage of five minutes, at Crewe, for water, in one hour and thirty-one minutes, or at the rate of upwards of 35½ miles per hour. Her Majesty, on her arrival at Stafford, personally expressed to Captain Cleather, the manager of the Grand Junction Company, who was in attendance, her satisfaction at the rapidity of the passage, and the uncommon smoothness of the line. The engine, the Vandal, on its return, brought back from Birmingham a train occupied by the directors and chief officers of the company, who had been inspecting the line, and holding a board at Birmingham on that day. It left Birminghaun at 6 30 p. m., and arrived at Edgehill at 9 2 p. m., having made three stoppages of five, four, and three minutes; thus running the distance in two hours and thirty-two minutes, or at the rate of 38 miles an hour including stoppages, or 41 miles an hour exclusive of them. This is believed to be the most remarkable performance, for a continued distance of this extent, that has yet taken place on this or any other railway in the kingdom. This engine, in both its trips, was under the direction of Mr. Buddicom, the superintendant of the locomotive department of the company.

Taff Vale Railway.—The Taff Vale Railway Bill has just received the royal assent, and we have to congratulate many of our friends on the happy result, which must be gratifying to the directors and proprietors generally. It is due to the former, to say that nothing but great perseverance and determination could have stemmed the torrent of powerful opposition which the bill had to contend with. By the new act, all restrictions as to speed, interest, freighting, directors, &c., are done away with, the undertaking now standing as free and open as any other speculation; and, from what we have heard, we have no doubt it will be one of the best investments of the kind to be met with. We understand, from undoubted authority, that every exertion is now making to open the line as speedily as possible, and that, in fact, the carriages will very shortly be ready to convey passengers from Cardiff to Newbridge. Bristol, we find, is not without its advantage in this undertaking as to her manufactories, for our spirited citizen, Mr. Williams, of Temple Gate, has received orders for eight carriages, to be ready within two months.—*Bristol Mercury.*

Maryport and Carlisle Railway.—The portion of this line of railway between Maryport and Arkleby coal-pit, near Oughterside, a distance of seven miles, has just been opened by the directors and a party of their friends. The train started at eleven o'clock, and in about half an hour arrived at the present terminus. Twenty wagons loaded with coal were here waiting to be attached to the engine, and were conveyed back to the harbour, where they were rapidly shipped on board the *Cly*, of Harrington; another train of twenty wagons, also loaded with coal, was afterwards carried along the line, and shipped on board the *Betsy*, of Maryport. The trade in minerals will be very great, and will prove a great source of revenue to the company. Another portion of the line is staked out at the Carlisle end, which will be immediately proceeded with; previous to which about two miles more of the line beyond Oughterside will be completed. The directors and their friends dined together in the evening, in the Assembly Room of the Senhouse Arms; and the workmen employed on the line were also regaled with a dinner at the Golden Lion Inn, at the expense of the directors.—*Abridged from the Whitehaven Herald.*

Effects on Railways.—We learn from a Correspondent, that since the railway was opened to Lancaster, there have been already increased facilities of travelling from Kendal; but on Monday next, two additional coaches—one by Croall, Sheldon, and Co., and the other by Holmes, Fisher, and Co.—will be put upon the road between Carlisle and Lancaster. After that, there will be through and from Kendal daily—

3 miles each way..... 6
5 coaches do.....10

16 coaches through.

4 coaches, in and out.... 8
2 swift packets in and out, each packet being equal to three coaches.....12

—starting from Kendal. Altogether, as thirty-six coaches to and through the town of Kendal; whereas it was but "the other day" that the only public conveyance the town could boast of, was a (literally) heavy coach three times a week, which occupied sixteen hours in the journey from Kendal to Liverpool (seventy-five miles), and in which space of time a person can now travel from Kendal to the South coast, Southampton (366 miles). This is certainly a good prospect for the proposed Kendal railway. Give facilities and get passengers!—*Railway Times.*

Railway Inquisitorship.—We believe the three chief aspirants for the office of inquisitor-general, contemplated under Lord Seymour's bill, are Sir F. Smith, one of the railway commissioners; Capt. Moorsom, of the London and Birmingham Company; and Captain Pringle, of the South Eastern.—*Railway Magazine.*

Paris and Rouen Railroad.—The first general meeting of the shareholders of the Paris and Rouen Railway was held on Thursday, at the saloon of M. Hertz, in the Rue de la Victoire, to deliberate on the modification of the statutes rendered necessary by the changes in the bill which were made by the Chambers. About 250 persons were present, representing 31,000 shares, of the total number of 72,000. The statutes require for the general meetings only the presence of 200 shareholders. M. Laffitte, who presided on this occasion, read the report of the committee of management, of which he is chairman, and from which it appears that three years will suffice for the termination of the whole line. The proposed modifications were agreed to by the meeting, but it was resolved that the company should make every effort in their power

to get the interest guaranteed by government, and which had been reduced from 4 per cent. to 3 per cent., restored to the former amount in the event of such a concession being made hereafter to any other company. The amount to be allowed to the committee of management, which, according to the decision of the Council of State, was to be referred to the general meeting, led to a very stormy discussion. It was contended, that to give to twelve persons a *minimum* remuneration of 100,000 francs a year, was to burden the company improperly; but after some observations from M. Laffitte, as to the heavy duties imposed upon these gentlemen, the proposition was agreed to by a large majority.—*Galignani's Messenger.*

Railroad between Milan and Venice.—The Austrian Government, in order to promote the construction of the railroad between Milan and Venice, has granted permission for the introduction of foreign iron to the extent of 100,000 quintals (upwards of two millions of pounds), at a duty of four florins (about seven shillings) per quintal.

Namur Railway.—The works on the railway near Namur have commenced very vigorously.

GRATUITOUS COPIES

of our Journal have been forwarded to a number of Individuals interested in some Patent, or Invention, of which notice has been taken in our number of to-day.

TO CORRESPONDENTS.

We shall, at all times, be ready to answer questions *that may be put to us, relative to any of the subjects indicated in our title; and questions put during the current week, will be replied to either the same, or following week.*

"The Inventors' Advocate, *and* Journal of Industry," *may be forwarded,* postage-free, *to all the undermentioned places:—*

Antigua	Demerara	Montserrat
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Berbice	Gibraltar	Nova Scotia
Bermuda	Greece	Quebec
Brazils	Grenada (New)	Spain *via* Cadiz
Bremen	Halifax	St. Domingo
Buenos Ayres	Hamburgh	St. Kitts
Canada	Heligoland	St. Lucia
Caraccas	Honduras	St. Vincent's
Carthagena	Ionian Isles	Tobago
Cephalonia	Jamaica	Tortola
Columbia	Laguayra	Trinidad
Corfu	Malta	Zante
Cuxhaven		

It will be transmitted, upon payment of one penny, *to India, the Cape of Good Hope, and New South Wales.*

To all other places, it can be forwarded on payment of two-pence.

"The Inventors' Advocate" *is published every* Saturday Morning, *at* 7 o'Clock; *if, therefore, our Subscribers do not receive their copies* regularly *from their Newsmen, the fault never rests with* us.

For the convenience of persons residing in remote places, *the* "Inventors' Advocate," *will be regularly issued in* Monthly Parts, *stitched in a handsome wrapper.* Parts 1 *to* 13, are now Ready.

Advertisements *should be sent in not later than* Thursday Evening.

"T. Craddock," Broadheath.—*This address, it seems, is incorrect. The Post Office have returned several of our Papers to be more plainly addressed, but the above address is all our Correspondent has given us. Will he oblige us by writing again, and enclosing half a sovereign, in advance for his proposed subscription? Our Correspondent's letter came to hand yesterday.*

"Ebenezer P——."—*Yes. The inventor is Mr. James* Hall, *of Glasgow.*

"W. Elliott."—*All must depend upon the written* agreement *between the parties, which will be brought forward as*

which case as this, we recommend our correspondent to consult a solicitor.

G. King.—*The specification of Mr. Thomas* Farmer *will appear in the* "Inventors' Advocate" *of September 5.*

"J. Vernon."—*Our Correspondent will receive a reply by post. His letter has been handed to the gentleman addressed by name.*

TO OUR SUBSCRIBERS.

Two *numbers of the* "Inventors' Advocate" *(Nos. 48 and 49) were published* July 4. *The former contains, in addition to the usual varied matter, the* Title Page *and a* Copious Index *to the* Second Volume.

Volume II. *of the* "Inventors' Advocate," *handsomely bound, is* Now Ready. *A* Few Copies *of the* First Volume *still remain on hand.*

TO INVENTORS.

ALL PERSONS who may be desirous of TAKING OUT PATENTS, or of bringing VALUABLE INVENTIONS into USE, are requested to APPLY to the PROPRIETORS of "THE INVENTORS' ADVOCATE," (DELIANSON CLARK & CO.) at their "PATENT AGENCY OFFICE FOR ALL COUNTRIES," 39, CHANCERY LANE, where they may be consulted, daily, relative to the PATENT LAWS of GREAT BRITAIN, and ALL OTHER STATES.—(See ADVERTISEMENT on the last page of the present Number.)

THE

INVENTORS' ADVOCATE,

AND

JOURNAL OF INDUSTRY.

SATURDAY, AUGUST 8, 1840.

A meeting of the Anti-Corn Law Association was held on Monday, for the purpose of winding up the affairs of the association for the present Parliamentary session. At this meeting, the report of the committee appointed to conduct the opposition to the corn laws in Parliament was read, from which it would appear that considerable sums of money have been spent in sending lecturers to different places to expose the fallacy of the corn laws, in disseminating anti-corn law publications, and in *getting up petitions* to the House of Commons and the House of Lords. Now, though we agree in principle with the Anti-Corn Law Association, we neither go the length of wishing for an entire remission of the duties on importation—at least for some years to come—nor do we conceive the means they adopt are the best calculated to attain the object they have in view. We endeavored to show, in recent articles on the subject, that the corn-law question is not so free from difficulties as the anti-corn law agitators would have us believe. Our opinion is most decidedly in favor of a fixed duty, instead of a variable one, and we incline to think that the arguments are so strong in support of such a regulation, that the agriculturists themselves would be ready to make the change, were it not that their fears are excited by the violent language and ultra views of the anti-corn law agitators. There can be little doubt, that they have by these means damaged the progress of the question in the House of Commons; and though they may have advanced it somewhat among the people, by lectures, and by issuing printed tracts, we should be sorry to see a great national question of this kind carried by popular clamor.

The members of the Anti-CornLaw Association are anxious to disclaim any connection with political parties, but the general tenor of their speeches is at the same time calculated to influence the working classes against the landed proprietors. The indifferent manner in which the corn-law question was treated in the House of Commons is alluded to as an indication of the little chance the people have of obtaining justice from an interested jury of landholders. Such representations as these are little calculated to induce the landowners to view the question with calmness, or to risk any change in the present system; and they are not likely to yield the question involuntarily to the prayers of *got up* petitions. When, indeed, the people can be made to feel that their interests are directly involved in the corn laws, and that the substitution of a fixed for a fluctuating duty would produce a positive improvement in their condition, they will petition Parliament without prompting.

We are glad to find from the report of the committee, that the question is making its way among the people, but we wish it were directed by less violent hands. Involved as the manufacturing interests of the country are with those of the agriculturists, any sudden change, brought about by the intimidation of popular clamor, would be more injurious to all classes than the continuance of the present impolitic system. It is our hope that the landowners themselves may see the wisdom and expediency of altering the present corn laws, that have manifestly failed to answer the purposes for which they were proposed; and that by a deliberate consideration of the question, before circumstances occur to agitate the

public mind, our legislature may pass such measures as will satisfy the manufacturing population, whilst they afford adequate protection to the agricultural interests.

ELECTRO-MAGNETIC TELEGRAPHS.

The observation of the effect of a current of electricity in deflecting a magnetic needle, was the first step in the progress of discovery in the science of electro-magnetism; the application of this peculiar action has also been the first successful step towards bringing the principles of that science into practical use. A telegraph on this principle has now been at work on the Great Western railway nearly a year. The committee on railway inquiry, before whose notice the invention was incidentally brought during the course of their investigations, thought the subject of such importance that they went beyond the strict line of their instructions to direct the attention of Parliament especially to its consideration, as an object of national interest. We are glad that the matter has been thus placed before the public in a form that is most likely to produce beneficial consequences; though we wish the committee had taken a more extended view of the sphere of operations to which this new means of communication may be applied. From some observations at the conclusion of their notice of this invention, it would appear they look upon it with a degree of dread, as the means of giving certain privileged individuals the facility of quicker communication than can be generally attained. Some fear is entertained lest the government should be outstripped in information by these electrical modes of communication, which leave the former telegraph far behind in expedition and convenience. Had the committee taken an enlarged view of the question, instead of looking at the improvement with fear and trembling, they would have regarded it, with unmixed satisfaction, as a new means of facilitating the communications between distant parts of the country, and would have recommended the adoption of experiments on an extended scale for national purposes.

Professor Wheatstone* and Mr. Cooke have devoted much time and attention in bringing the electro-magnetic telegraph into operation; and it was under their management that the telegraph on the Great Western Railway was laid down. They have made many improvements on their first attempts, and have taken out several patents, as each advance rendered their former successes comparatively valueless; but the principle on which the action of the telegraph depends is, we believe, the same in all. To those who are unacquainted with the nature of electro-magnetic action, it may be interesting to know the means by which instantaneous communication between remote places can be made. The details of the arrangements may be varied and simplified, but the principle of action is the point of most interest.

It was discovered by Professor Orested, that when the wire which unites the two poles of a galvanic battery is placed over a magnetic needle, in the line of the magnetic meridian, that end of the needle which points towards the negative pole of the battery is deflected towards the west. When the wire is placed in other positions, the deflection varies; but in all cases the movements of the needle show that it is strongly influenced by the electric current when it passes near to it. The extent of the deflection depends upon the strength of the electrical current, and the sensibility of the needle, but it can in no case exceed 90 deg. Let us suppose, then, that we have a number of magnetic needles with wires passing over them, each one of which may be at pleasure connected with a galvanic battery so as to cause a current of electricity to pass over any needle which is required to be moved. We should thus have all the elements of an electro-magnetic telegraph. For instance, the movement of each needle separately, or in combination with the others, may be symbolical of understood meanings, and as the current of electricity passes through insulated wires, to a distance without any known limits, at the rate of 200,000 miles in a second, these symbolical communications might be kept up from one end of the kingdom to the other, instantaneously.

The electro-magnetic telegraph on the Great Western railway consists of five working magnetic needles, acted upon by five wires, which are insulated from one another by being wrapped round with cotton and india-rubber varnish. These needles are fixed to a dial plate, on which are twenty letters of the alphabet, and the dial plate is so arranged, that, by the movement of two of the needles, any one of these letters is pointed to. The communication, therefore, may be made intelligible to any one, and may be read off as the letters are indicated. In order to increase the effect of the electrical current on the needles, the wires connected with the battery are coiled round near the needles, which greatly adds to the power of the electricity in deflecting them from the magnetic meridian. A contrivance has also been made for giving a signal at each station, so that the persons in attendance may know when any communication is about to be made. This is effected, by directing the electric current through a coil of wire twisted round a piece of soft iron. The iron then instantly becomes powerfully magnetic, and draws out the iron detent bolt of an alarum, which directly commences ringing. The mode of making the communication between the wires and the battery, and breaking it again, is easily managed, by keys like those of a pianoforte, so that the telegraph, after a little practice, may be worked with great rapidity. The distance to which the present telegraph extends is thirteen miles, but Professor Wheatstone stated, in his evidence before the committee, that from the experience he has had of the working of that telegraph, there is no reason to suppose the communication might not be extended with the same success all the way to Bristol. A person touching the keys of the telegraph in London, would thus be able instantly to communicate with the person at the station in Bristol, either by night or day.

The cost of the telegraph to Drayton was about £200 per mile, but that was the first experiment, and consequently would be attended with much greater expense than subsequent undertakings. Besides, since that telegraph was laid down, Professor Wheatstone and Mr. Cooke have made considerable improvements in the arrangements of the apparatus, by which all the communications can be made by two wires, instead of five. This simplification of the machinery must necessarily diminish the expense, therefore it is not too much to expect that, after more practical experience, the cost will not exceed one quarter that of the first attempt. As the wires are conveyed through water-tight tubes, rivers will form no obstacle to the construction of these telegraphs, and Professor Wheatstone stated, in answer to a question from one of the committee, that he conceived it would be perfectly practicable to communicate from Dover to Calais in that way.

With this evidence before us of the success which has already attended the attempt to communicate between distant places by electro-magnetic action, we feel justified in entertaining confident expectation that before long, this

* We have elsewhere noticed the evidence of this gentleman before the committee.

mode of communication will become generally useful, and be only inferior in importance to railways. So far from supposing, as the railway committee appears to have done, that its range must be limited to certain privileged parties, we conceive that electro-magnetic telegraphs may be constructed to all parts of the kingdom for public use. Not more, we believe, than four years have elapsed since the idea was suggested of forming a communication by this means, and it is now in practical operation most successfully for a distance of 13 miles. In a few years more, the arrangements may be still further simplified and improved, so as to reduce the expense of laying down insulated wires from town to town, to an insignificant amount. The multiplication of such telegraphs would be the necessary consequence, and the general adoption of them as means of communication seems, therefore, by no means improbable.

NEW INVENTIONS.

HOLMES' IMPROVEMENT IN SHIP-BUILDING.

A meeting was held on Saturday last, at the residence of Mr. Holmes, who fully proved to the satisfaction of all the scientific gentlemen present, that vessels might be built, (in direct opposition to the opinion of Dr. Lardner), on the improved principles set forth, and fully explained, in two of our former numbers. It was suggested by one of the Professors of the College of Civil Engineers, that in place of building ships of 2,600 tons, to pass by the Mediterranean and Red Sea, on to India, it would be far better to build steamers from 5,000 to 10,000 tons, for the purpose of completing the voyage to India by the Cape, which could, on the improved principle adopted by Mr. Holmes, carry out the full complement of coal.

A singular feature in these improvements must attract the attention of every warlike government, as percussion balls would have no effect, when, in wooden vessels, one ball alone would be the means of sinking a first-rate man of war.

IMPORTANT IMPROVEMENT IN GUN CARRIAGES.

Friday Prince Labanoff de Rostoff, Major-General of the Russian Army, and M. Bankhausen, the Russian Consul-General, with many scientific gentlemen, paid a visit to the grounds of the Ben Johnson Taveru, in Stepney, to inspect an important improvement which has recently been made by Mr. J. Brown, of Limehouse, to entirely obviate the inconveniences attending the recoil of guns on board ship. The new carriage consists of two frames, the uppermost of which, however, is elevated at one end, to an angle of about fifteen degrees, when the gun is about to be discharged, and the leading feature of the invention is that the gun on its discharge has to recoil up hill. There are other advantages resulting from this plan, inasmuch that no tackling is required to work the gun, and consequently no strain on the side of the vessel; and it was evident that two men could work a 60-pounder in battle with as much ease as the 16 or 20 men now required for that service, while the rapidity of firing would be increased in a four-fold ratio. The gun was rapidly discharged in the field behind the tavern, and with the greatest ease. The piece was a four-pounder weighing 3¼ cwt., and a gun-deck being represented for it to work on, a boy was found equal to perform all the operations of loading, running the piece out, and firing. The visitors expressed themselves highly satisfied with the experiment, and proceeded to the ball-room of the tavern, where a very large and splendidly finished gun-carriage on the new principle, and intended for a 36-pounder, was exhibited. It was understood that the carriage had been purchased for the Russian Government, who it appears in this, as in every other important invention, are the first to take advantage of English ingenuity. The Prince and Consul were much pleased with the invention, and the manner in which it had been got up, and paid a high compliment to Messrs. Brown and Barrett, the patentees. There is no doubt of its being a very important improvement in the science of gunnery, and will save a vast deal of manual labor. Mr. Brown, the inventor of the new gun-carriage, has been long known to the scientific world by many important inventions, of which the patent capstan, the chain controller, and the chain stopper are the best known. The gun-carriage, from its extreme simplicity of action, may be said to eclipse all his other productions. The Lords of the Admiralty intend shortly to make the experiments with Mr. Brown's gun-carriage on board ship on a very large scale. The result will, no doubt, prove its great utility, and its adoption in our navy must follow as a matter of course. After Prince Labanoff de Rostoff and M. Bankhausen had left the grounds of the tavern, they were shown over the new and very extensive works of the New Commercial Gas Company, which commence the operation of lighting the large districts of Stepney and the Tower Hamlets in a few weeks. Messrs. Swallow and Morris, two of the directors, and Mr. Mercer, the engineer of the Gas Company, conducted them over the works, and pointed out the peculiar mode of manufacturing gas.—*Sun.*

AN IRON EXPRESS COACH, FOR CROSSING SANDY DESERTS.

The want of a vehicle of this description has long been considered a *desideratum* by European travellers, in their toilsome journeyings across the arid and scorching deserts of Egypt and Arabia; through which tracts, commerce is carried on and travellers must pass, to keep up the valuable commercial relations between many eastern nations. The importance of this intercourse becomes daily more evident to England. Hitherto the means of conveying travellers or merchandise over these extensive and barren sands has been, as our readers are aware, by camels and dromedaries, for wooden carriages of any construction were utterly useless, as it was found impossible to discover any species of timber that could resist the intense heat of those districts, which soon splits and rends the best seasoned timber, so as to render it useless after a few days' travelling. But travellers and commercial activity have increased so much of late years, that it was evident something *must be done* to facilitate these great objects—and British ingenuity has found out a mode of overcoming the difficulty by substituting *iron* for *wood*. In fact a carriage has been constructed, under the direction of Mr. Waghorn, by Messrs. Theodore, Jones and Co., of Spitalfields, (the patent iron wheel manufacturers). This vehicle, which is calculated to hold six persons, their stores, water, &c., has not the smallest portion of wood in its construction. The frame work, the wheels, shafts, flooring, benches, &c., are all of wrought iron bars, either flat or round according to purpose required; as, for instance, the floor is composed of light flat bars in two rows, one row runs parallel to the sides of the machine, and another row lies across them at right angles, the bars are set at two inches asunder, which leaves the bottom open like a net work, this is done to allow the temperate air to come up freely, and drive out the hot air as it generates through the top valves. The whole of the body and roof are covered with the best sort of storm stay-sail canvass; instead of wooden or leather panelling, the roof frame is simply that of the tilted wagon. There are two strong iron shafts for one horse; these are so constructed, that two other horses may be yoked to the machine, all three abreast; one horse will, it appears, be quite sufficient for the ordinary work. There are hair cushions placed on the benches, which form seats quite as comfortable as those of any other coach. The machine is hung on the contrical spring principle, which discharges the weight from the horse, and throws it on the wheels —this is another great advantage in a hot country. In fact, the excellence of this new machine may be summed up in a few words—viz., strength, lightness, durability, cheapness, and ventilation. It will thus afford, when brought fully into operation, a safe and comfortable conveyance for travellers, despatches, and the lighter articles of commerce, and is likely to be the means of opening extensively that easy intercourse between Palestine, Persia, Arabia, and Egypt which is greatly wanted, and would vastly extend the bounds of human knowledge, commence, and civilisation.

ELECTRICAL TELEGRAPH.

The following evidence on this important invention, (which we have noticed elsewhere), given before the Committee on Railways by Professor Wheatstone, will be read with interest:—

326. Lord Granville Somerset—Suppose the Great Western Railway were completed between London and Bristol, do you contemplate the possibility of carrying your telegraph through the whole way, so as to signify from London to Bristol anything you wish to communicate, and *vice versa* from Bristol to London?—The experiment has not been tried, but I have every reason to believe that it can be done.

You must multiply your power considerably in that case; but if you can multiply your power sufficiently, there is no difficulty, in your opinion, in performing that?—One very important circumstance I have ascertained, is the little power requisite to produce this effect; it was formerly thought, that to send a current to any considerable extent very strong batteries must be employed, but, in fact, a very weak battery is sufficient, provided only it consist of a number of elements proportionate to the distance.

328. Do you see any practical difficulty in proportioning the number of your batteries to that extent, of 100 or 120 miles?—I think there is none.

329. So far as your experiments have gone, you think you should be able to effect this telegraphic communication between Bristol and London?—Yes; possibly several stations may be required, but, at any rate, the stations may be at very far greater distances from each other than would be required for any ordinary system of telegraphs; my opinion is, that the intermediate stations will not be required.

329. You think you may communicate to the Reading station, the Reading station to another in the direction of Bristol, and that to Bristol?—Yes; this means would be adapted if it should be found impracticable to effect an immediate communication between the two extreme stations.

331. How long has the line been laid down upon the Great Western?—I think it was finished in July last.

332. Do you think you have had experience enough during the last winter, to ascertain that it will not fail you in consequence of any inclemency of weather, or circumstances of that nature?—If the wires are properly protected, I think there is no fear whatever.

333. Do you conceive they can be so protected, that weather will have no effect upon them?—Yes, that is my judgment from experiment.

334. Mr. Loch—Is there any appreciable loss of time in making a communication from the Paddington station to the extremity of the line to which the telegraph is now carried?—From some experiments I made some years ago, published in the Philosophical Transactions, when I first turned my attention to the possibility of effecting telegraphic communications, I ascertained that electricity travelled

through a copper wire at the rate of about 200,000 miles in a second; consequently there is no appreciable time lost in the communication of the electrical effect; the only time that would be lost would be at relay stations, if they were necessary.

338. Chairman—Have the applications you have had from foreign countries to put up this means of communication been in connection with railways, or separate from railways?—All in connection with railways.

339. Is it of any consequence that it should be on a railway, or does a railway offer any advantage in that respect?—Not the slightest advantage with regard to laying down the line, but a great one with respect to its protection from injury.

340. Sir John Guest—Have you tried to pass the line through water?—There would be no difficulty in doing so, but the experiment has not yet been made.

341. Chairman—Could you communicate from Dover to Calais in that way?—I think it perfectly practicable.

342. Have you any further observations to make?—An electrical telegraph offers a great many advantages over an ordinary telegraph; it will work day and night, but an ordinary telegraph will act only during day; it will also work in all states of weather; an ordinary telegraph can only work in fine weather. There are a great number of days in the year in which no communication can be given by an ordinary telegraph, and, besides, a great many communications are stopped before they can be finished, on account of changes in the state of the atmosphere; no inconveniences of this kind would attend the electrical telegraph. Another advantage is, that the expense of the separate stations is by no means comparable to that of the ordinary telegraph; no look-out men are required, and the apparatus may be worked in any room where there are persons to attend to it. There is another advantage the electric possesses over the ordinary telegraph, viz., the rapidity with which the signals may be made to follow each other. Thirty signals may be conveniently made in a minute; that number cannot be made by the ordinary telegraph. There is one thing I will take the opportunity to mention: I have been confining the attention of the Committee to the telegraph now working on the Great Western Railroad, but having lately occupied myself in carrying into effect numerous improvements which have suggested themselves to me, I have, conjointly with Mr. Cooke, who has turned his attention greatly to the same subject, obtained a new patent for a telegraphic arrangement, which I think will present very great advantages over that which at present exists. It can be applied without entailing any additional expense of consequence to the line now laid down: it will only be necessary to substitute the new for the former instruments. This new apparatus requires only a single pair of wires to effect all which the present one does with five, so that three independent telegraphs may be immediately placed on the line of the Great Western; it presents in the same place all the letters of the alphabet, according to any order of succession, and the apparatus is so extremely simple, that any person without any previous acquaintance with it can send a communication and read the answer.

343. Sir John Guest—Does not the possibility of cutting off the communication between one point and another occur to you?—The same objection may be made with regard to railroads themselves.

344. Suppose any person were to stop the communication from one town to another?—By destroying the continuity of the rails, they might stop the passage of the trains.

345. The common telegraphic communication could be kept up notwithstanding that?—Certainly.

346. Chirman—Can you state the expense which would be incurred in laying it down?—I am hardly prepared to state that, because only one line has been laid down at present.

[Mr. Saunders, who was next examined, stated that the expense would amount to £200 or £250 a mile.]

SCIENTIFIC MEMORANDA,

AND

NOTES ON ART.

New Kind of Tin Plate.—M. Budy has formed a superior tin plate of iron and nickel. It is five or six times harder than that now in use, and is very advantageous for culinary utensils, as it does not communicate any color to sauces, which common tin plate frequently does.

Galvanoplastics.—Munich, July 22.—Much is at present said in the public papers respecting the imitation of medals, reliefs, &c., by means of a galvanic deposition of copper. This art, called Galvanoplastic, first discovered by Professor Jacobi of St. Petersburgh, and brought to greater perfection by Mr. Spencer of Liverpool, and by Professor Von Kobel of Munich, may justly be classed among the most useful of modern inventions; and from its great importance, its employment in technical operations must soon become general. Indeed, some persons in England, perceiving the great influence which this invention is destined to have on manufacturing industry, are already applying it to the production of buttons, arabesques, and various kinds of ornaments in copper. Herr G. A. Muller, mechanician of Leipsic, too, has recently called attention to the application of Jalvanoplastic to typography. He has, however, been in some measure anticipated by the experiments made in 1839 at Rosel's printing-office in Munich, where, by following the method of Jacobi and Spencer, the lines of copper plate were produced in relief. Woodcuts were also converted into metallic plates, which, to say nothing of the advantage of the solidity of the metal, far exceeded the effect of the most perfect casting. The experiments for making stereotype plates in copper have also been successful. In short, the invention has now reached that stage which must secure for it the attention of all practical men.—*German paper.*

Mode of making Sheet Lead in China.—The Chinese, in manufacturing the thin sheet lead in which their teas are imported into this country, conduct the operation in an exceedingly simple manner. The laminæ are not rolled, as from their extreme thinness might be supposed; nor even hammered, as the appearance of the surface might indicate; but actually cast at once in the state in which we see them. Two men are employed: one of them is seated on the floor, with a large flat stone before him, and with a moveable flat stone-stand at his side. His fellow-workman stands beside him, with a crucible containing the melted lead; and having poured a sufficient quantity on the slab, the other lifts the moveable stone, and placing it suddenly on the fluid lead, presses it out into a flat and thin plate, which he instantly removes from the stone. A second quantity of lead is poured on in a similar manner, and a similar plate formed; the process being carried on with singular rapidity. The rough edges of the plates are then cut off, and they are afterwards soldered together for use. Mr. Waddell, a Scotchman, who witnessed the operation in China, applied a similar method, with great success, in the formation of thin plates of zinc for galvanic purposes.—*Lardner's Cyclopædia.*

Length of the Pendulum.—It has been found by 11 series of observations at Toulouse, that the pendulum in a vacuum at the level of the sea, at a temperature of 15 degrees centigrade, would make 87,897-45 infinitely small oscillations in 24 hours, while under the same circumstances at Paris, it would make 87,916 22. Hence the length of the pendulum at Toulouse is 993-4,326 mil,y and at Paris 993-8,565 mil., which gives for the sphericity of the earth 1-252 instead of 1-306. It is supposed the difference is far too great to be due to the observations.

New Machine for Distributing Printing Types by Mechanism.—The *Débats* states, in allusion to the new invention at Pesth in Hungary, for composing and distributing printing-types by mechanism, and of which we gave a passing notice a fortnight ago, that two Frenchmen have invented a machine for the same purpose, by which *they say* they have produced even superior results to those which have been obtained by the machine at Pesth. Patents for this discovery, says the *Débats*, were applied for in England and in France several months ago.

Description of a Calculating Machine invented by Mr. Thomas Fowler, of Torrington, in Devonshire.—The arithmetical operations performed by the machine, are those of multiplication and division; the factors and product in the former case, and the quotient, dividend, and divisor, in the latter, being expressed in digits of the ternary scale of notation, every digit being either—1, 0, or + 1. In this system, unity being, in multiplication, only an index, the rules for multiplication and division must consist entirely in directions for the management of the signs of unity; and it is on this principle that Mr. Fowler's machine is made to act. It is necessary however, in applying it to use, to have recourse to tables, both for converting the factors and reconverting the result; operations which introduce both labor and risk of error.—*Proceedings of the Royal Society, June* 18, 1840.

VARIETIES.

London University College.—The annual meeting for the distribution of prizes to the successful pupils of the juvenile classes, took place on Tuesday, in the large theatre of the institution, H. Crabbe Robinson, Esq. in the chair. The prizes which were presented, were given to the successful competitors for proficiency in the classics, English Language and Literature, History, Geography, German, &c. At the conclusion, the chairman gave an address to his juvenile auditory on the advantages which had led to their present distinction. The prizes consisted of standard works, elegantly bound. There was a very large attendance, particularly of ladies.

The Newspaper Press.—The increase in the circulation of London newspapers, since the reduction of the stamp duty, has been annually 9,885,943, or 47 per cent. on the previous circulation. The increase in the English provincials, has been 11,370,452, or 137 per cent.; Scotch, 1,320,006, or 49 per cent.; and Irish, 364,452, or 7 per cent. on former circulation.

Kingston-upon-Railway.—The history of this beautiful little town in embryo, we beleive, is not generally known. It is situate near Kingston-upon-Thames, under cover of the adjoining hills, not unlike Bath (but we have not yet heard of a King Bladud), at the first station of the Southampton Railway. Two years ago, the executors of a gentleman possessing 100 acres of land gave out that they should advertise them for sale by auction. Mr. Pooley, a maltster in the neighborhood, felt an inclination to be the possessor, and offered £7,000; but he was told the upset price was £10,000, £2,000 of which he immediately deposited. This was no sooner done than £7,000 were offered for his purchase, then £26,000, then £60,000, and finally by some *quidnunc* in the city £120,000, at an interview with whom Mr. Pooley assured him, to his astonishment and surprise, that he had offered about one-half of what he would take. He immediately set about building and letting out the land, and some beautiful villas and lines of commodious houses have been erected within 18 months, and in a short time we understand 300 houses will stand upon the ground. Mr. Pooley has liberally offered ground as a site for a church, and minister's house and garden, and £500 to make a beginning. New Kingston is 10 miles from London, which is run on the railway in from 12 to 15 minutes. The salubrity of the air may be appreciated from the following circumstance:—At an assembly of 12 inhabitants of almshouses, their united ages amounted to 1,072 years.—*Times.*

Coins found in Charnwood Forest.—On the 2d of June last, an urn or vase, such as is frequently found in Roman sepulchres, of very plain workmanship and totally unornamented, was found in Charnwood Forest, in that part of it which is at present in the occupation of the monks of the Cistertian convent which has lately been established in that neighborhood. Charnwood is not far from Loughborough, in Leicestershire, and the spot in which the vase was found is in the highest part of the forest, and in a place which has probably never been used as arable, and until the present time. The vase, which will contain about two quarts, was filled with coins of the Roman empire, varying in time from the year of our Lord 40 to the year 68. The coins that have been taken indiscriminately from the mass in the vase, are of a base metal; they are white when cleaned from the incrustation of rust and corrosion, and in good preservation. On the obverse, they bear the heads of various emperors and sons of emperors, with the legends, Marius, Probus, Phillip, Quintillus, Gallienus, Salonione, Claudius Gothicus, Victorinus, &c., and on the reverse are figures of Venus, Fortuna, &c. The vase has probably been in the ground since the year 426, in which the Romans left England, or perhaps longer. It was discovered by a lay brother of the convent, John M'Donell, and two laborers, W. Hickey and C. Lett, as they were ploughing. The vase was not more than a foot below the surface. The vase and its contents are now on view at Mr. Abraham's, No. 8, Bruton-street, where they have been inspected by several antiquaries.

New Kind of Silk Worm.—At a reeent sitting of the Academy of Sciences at Paris, M. Audouin presented some live caterpillars, being a new kind of silk worm, from New Orleans. It is known that the species of the genus *bombix* are very numerous, and the *cocons* of all are composed of pure silk; but the *bombix mori* is the only one that has been found available for the production of silk, all others having proved unprofitable. In some countries, however, they use the products of the different wild species of caterpillars, which the natives employ themselves in gathering. The species presented to the Academy by M. Audouin was sent to him by M. Lavalleé the director of the central school of arts and manufactures, who had received some *cocons* from New Orleans, where they are taken by the natives to spin out the silk. M. Audouin having perceived that these *cocons* contained chrysales, he kept them carefully, till they became butterflies, and he obtained eggs. As the worms were hatched about the middle of May, he was able to make a great many experiments for the purpose of discovering the best kind of leaves for feeding them with. He found that the leaves of many kinds of American plums, and even our common garden plums, suited them very well. At present these worms appear to be very vigorous; they are as much as one decimetre (about four inches) in length, and they are remarkable for their beautiful colors, and for the prickles which cover the numerous tubercles of their bodies. M. Audouin concludes, from his first experiments, that it will be easy to multiply and rear this new kind of silk worm, should it be found that the silk produced renders it desirable to propagate the species.

Ghent.—The culture of exotic plants has been so much attended to at Ghent, that is has become an important branch of industry in that city. There are more than 400 green-houses there belonging either to amateurs or to floral gardeners, who annually send to France, Italy, Germany, and Russia a quantity of these plants, amounting in value to about 1,500,000 francs.

English Antiquities at Calais.—To the Editor, s,—You correspondent in his interesting account, week, o

"English Antiquities at Calais," and the Wodehouse arms and legend there discovered, tells us that the arms are not those now borne by Lord Wodehouse (Wodehouse of Kimberley), and infers that the date of the painting is prior to Agincourt. Now, that family have undoubtedly used their present bearing since the days of John Wodehouse, called by Henry V. his "beloved Esquyre," as charters with John Wodehouse's seal, dated 1420, &c., show, and the tradition is, that the grant made by that monarch to his favorite was not a new coat, but an augmentation—viz, "gonts of blood" on a chevron before plain "or." In the absence of other evidence, I think it will be found that the date of these emblazonments is later. Will your correspondent tell us if the arms are quarterly, azure, and ermine, with a leopard's head, or, first quarter? This was the bearing of another Norfolk family of Wodehouse, Wodehouse or Waxham, inferior indeed to the Kimberley family in antiquity and historical illustration, but employed in public affairs, and often noticed from the time of Henry VII. to Charles II., when their male line seems to have become extinct. Of this family, there were two Sir Thomas Wodehouses, *temp.* Henry VIII. and Edward VI.—Your's, CAMDEN.

Aug. 3, 1840.

Obliteration of the post-mark from the Adhesive Label, by means of a certain Chemical Process.—A master chemist in this town, a short time ago, by means of a chemical application, which of course he has not made known, completely succeeded in obliterating the Post-office mark on the profile of Her Majesty. Thinking that the discovery might be of importance to Government, he immediately communicated the fact to the General Post-office, enclosing in his letter one of the profiles from which he had obliterated the Post-office mark. In the course of a few days, he received a communication from one of the officials in the General Post-office, not very remarkable for its courtesy, informing him that he had not succeeded in obliterating the Post-office mark, and that the profile sent to the General Post-office, if used a second time, would be detected by any postmaster in the kingdom, Anxious to open the eyes of the obstinate to conviction, our townsman took two of the profiles from the letters which had passed through the Post-office, obliterated the post-mark from both, wrote again to the post-office authorities, enclosing one of the profiles for their inspection, and actually franked the letter he sent them with the other. This letter he caused to be posted by a friend in Liverpool, and the postmaster of that town did not discover the fraud, for the obliteration was so complete as to render detection impossible. The letter, which reached its destination, contained a recipe for the obliteration, in order that the Post-office authorities might convince themselves that the destruction of the tattooing was practicable. What steps will be taken by the Postmaster-General in this affair, remains to be seen—whether they will try some new method of tattooing the Royal profile, or whether they will choose to risk the liability of fraud, or adhere in future entirely to the Mulready system of franking with covers, which is certainly less liable to abuse than that of the Post-office stamp.—*Cumberland Packet.*

The Welch Iron Trade.—The *Hereford Times* states, that the extreme flatness which there has been for some months in the sale of this most important branch of our manufacture, still continues, and, we are sorry to understand, without the least prospect of any immediate change taking place for the better. The price of iron is at the present time lower than it has been for some years. A general reduction of wages all over the iron-works, is now in force.

Discovery of Lead Ore.—A short time since, while the sexton of Mothvey, Carmarthen, was digging a grave about five feet from the surface, he came to a very rich vein of lead ore of the finest quality; the vein is a very large one.—*Welchman.*

The Cotton in Mississippi.—The cotton prospects are stated to be grand almost beyond parallel in Mississippi. Both on high grounds, and on river bottoms, the growth has been astonishingly rapid, and if severe dry weather should come on as expected, great quantities of cotton will be picked in Adam's County, in the parish of Concordia, opposite side of the river, in the mouth of July. The cotton crop is the main stay of Old Mississippi, and a good crop this year, with the increase of prices, will be of immense advantage to the trading community. From New Orleans they write that new cotton was expected to arrive in the course of the present month; that planters would be free sellers; and that the crop was estimated at 2,500,000 bales.

Egyptian Flax.—We have a specimen of Egyptian flax, from a cargo of 1,000 tons now on its way to Scotland. The fibre is long, tough, and well colored, and sufficiently fine for any purpose to which Baltic flax is now applied. It has been raised by the Government of Egypt, which could quickly increase the supply to an enormous extent, provided a demand for it were got up in this country. We are informed by an experienced flax-spinner, from whom we received the specimen, that the trade with Egypt holds out many inducements which, if laid hold of, would soon materially affect our flax trade with the Baltic. Besides having a sea voyage free from all periodical obstructions, the flax can be obtained at a lower price, the manufacturer at the same time opening up a new and extensive market for the finished material.—*Fife Herald.*

Patent Rolling and Compressing Iron Company.—This Company have given an earnest of carrying out their operations, by their occupancy of very extensive premises at Rotherhithe, known as the Ordnance Wharf, well situated and adapted for the purposes required. We are given to understand, that the engines and requisite machinery are being manufactured by the eminent house of John Hague and Co., contracted for to be at work within two months; this, in addition to their present establishments in Staffordshire, will enable them to execute orders to any extent.—*Railway Magazine.*

King's College, London.—The council having determined to add a course of instruction in the arts of construction to the department of civil engineering and science, as applied to the arts of manufactures, William Hosking, Esq., has been appointed Professor of the Arts of Construction in connection with Civil Engineering and Architecture.

Mode of Preserving Fruit.—M. St. Aubin recommends for this purpose, to form with clay a mass similar in size and shape to the fruit to be preserved. This mass is then to be surrounded with a thin coating of wax, and when the latter has cooled, it is to be cut in half, so as to obtain two hollow hemispheres. The fruit is then to be inclosed in the latter, which are to be cemented together with fresh wax.

Theory of the Ripening of Fruits.—M. Fremy has written a memoir, in which he treats of the modifications which pectine undergoes by the action of chemical and natural agents. Green fruits contain a substance which is insoluble in water, and which may be changed into pectine by the action of acids even when greatly diluted. When the pulp of green fruits is mixed with a large quantity of water, a mass of insoluble matter may be extracted, which, if placed for some minutes in a dilute solution of malic, tartaric, or sulphuric acids, is converted into a mucilaginous substance, which is pure pectine. As green fruits contain very little pectine perfectly formed, Fremy attributes its formation in ripe fruits to the action of acid contained in the fruit. In fruits which are cooked, pectine is formed by the acid, whose action is accelerated by heat. Pectine may be considered as a true acid, which undergoes remarkable changes in its capacity of saturation. Pectine, by the influence of a base in excess, is converted into pectic acid. Both possess the same composition, but the latter requires two atoms of base to form a neutral salt. The change may also be produced by vegetable albumen, existing in some fruits and roots, which appears to act as a fermenting principle.

Some very curious Roman remains have recently been discovered in a house, at Strasburg, in the rue Dôme. In digging up the ground of a cellar, the workmen discovered, at a depth of about three feet, some flat stones about 16 inches square, and others eight inches square, bearing the inscription, the eighth legion of Augustus. There was also found a magnificent Etruscan vase, three feet high and 18 inches diameter, with designs on bas-relief of most beautiful workmanship. Another vase less valuable than the other was found 18 inches high and three inches in diameter, containing ashes. Unfortunately, the first of these vases was broken by the workmen.

Extraordinary Discovery of Skeletons.—A few days since, while the workmen employed in making the Cambridge branch of the Eastern Counties Railway were excavating in a field belonging to Mr. Laws, on Hoppole Farm, near Stratford, they discovered, at scarcely a depth of two feet from the surface, a stone coffin, seven feet long and nearly four feet across the shoulder part. They carefully removed the earth from around it, and on raising the lid, which was rounded on the top and of considerable weight, they found the remains of three persons. Two of them were decayed to the large bones and skulls, but the third was much more perfect. The skull remained apparently adhering to the back bone, and the skeleton comparatively perfect. This singular discovery has created a good deal of interest, and most of the gentry in the vicinity, as well as some hundreds of people, have been to see the bodies, or rather their remains. The coffin, which is a sort of freestone or Bath stone, is very substantial, and the lid, as has been before stated, is round on the top, and both heavy and substantial. The parish records, and several of the oldest inhabitants of the neighborhood, have been examined, but no information has as yet been obtained to throw the least light as to who the parties in the coffin were, or the circumstances which caused it to be deposited in so singular a place. It is the opinion of almost all who have seen the skeleton and bones, that the bodies to which the latter belonged must have been deposited in the coffin long before the former, from the fact of their being close to the foot of the coffin, while the other was in a proper horizontal position as when placed there. This opinion is also further favored, by the fact of the top of the coffin having been broken, apparently a long time ago. The coffin itself has been carefully examined, but it is quite plain and totally deficient of ornament, figures, or anything which was likely to assist the memory or allay conjecture. No inquiry or medical inspection has taken place, and the coffin is merely removed to another part of the field, where the curious as well as spectators are allowed to see it, and the men merely place the lid on at night and take it off in the morning.

Steam-boat Rivalry on the Rhine.—The rivalry between the Dutch and Prussian steam-boats on the Rhine, has lost none of its acrimony since the accident which occurred in the early part of the summer, or rather what has since been judicially proved to have been the intentional running down of the City of Cologne by a Dutch steamer. The court of Dusseldorf having sentenced the Dutch captain to pay an indemnification and costs, the Dutch vessels thought proper to resent this decision, by insulting the Prussians in their own land, and actually hoisted a broom on approaching the city of Dusseldorf, to their masts' heads. The boatmen of Dusseldorf, not slow in taking up their quarrel, determined to board and destroy the next Dutch steamer which should be guilty of this piece of impertinence, but the magistracy interfered and prohibited all violence, intimating at the same time to the Dutch captains that they would be held responsible for any act of provocation. A few days back, a Dutch steamer again appeared with a broom at its mast head, when the police went on board, and without ceremony arrested the captain and brought him on shore. What will be done with him is uncertain. Two new cases of steamers running foul of each other, have recently occurred. A Dutch boat which was hailed to take a passenger from one of the Dusseldorf Company's vessels, struck the latter with great violence and damaged her. Two boats belonging to the Cologne Company were likewise driven against each other, in endeavoring to avoid a skiff which was crossing the river between them at the moment of their meeting.

Ease of Style in Literary Composition.—Lord Dudley, in writing to the Bishop of Landaff from Farara in 1815, in speaking of the manuscript of Ariosto, preserved there, says "It consists of nothing less than the additional cantos (five I think, but I am not sure) of the Orlando, which did not appear till the second edition. It is all in his own handwriting, and bears strong internal marks of being the first copy. The inspection of that manuscript will greatly confirm the opinion of those who think that consummate excellence, united to the *appearance* of ease, is almost always the result of great labor. *The corrections are innumerable.* Several passages where, as they now stand, the words and thoughts seem to flow along with the greatest facility, and the rhyme to come unsought for, have been altered over and over, till scarce a line of the first draught has been allowed to remain." [The same remark may be made on Pope's Essay on Man, the manuscript of which is, we believe, in the British Museum.]

Character of a fine Hyacinth.—The characters required in a good Hyacinth are a strong, tall, erect stem, with a spike of numerous bells, each suspended on a strong short foot-stalk growing horizontally, so that the whole spike may present a compact pyramidal form or uppermost flower or bell, perfectly upright. The flowers or bells should be large and quite double, that is, well filled up with bold broad petals, appearing to the eye rather convex than flat or hollow. The spike of flowers should occupy about half the length of the stem. The colors ought to be clear and bright, whether plain red, white, blue, or variously intermixed and diversified in the eye, as this diversity gives additional lustre to a fine bloom. Strong bright colors are in general preferred to such as are pale, though there are several; light blue, rose, and white Hyacinths are held in high estimation. —*Trans. Hort. Soc. Pennsylvania.*

Crime in France.—A general statement of the number of crimes committed in France during 1838, has been recently presented to the King, by the minister of public justice. This statement, which is made with great accuracy, and affords minute details of the state of crime in France, presents great variations from those of preceding years. It exhibits a diminution of 29 in the total number of accusations made before the Court of Assizes, compared with 1837. If the classes of crime be divided into those against property and those against individuals, the former appear to have diminished 106; but the number of crimes against the person has increased 77. The proportion of crimes against individuals to those against property, was twenty-eight to one hundred in 1838, and it was only twenty-six to one hundred in 1837. The number of persons charged with assassination before the Court of Assizes, in 1838, was 239, which is the greatest number in any year since 1825. The greatest number of persons accused, of any particular class, consisted of those employed in agriculture; the number of those who had been employed in manufactures, was only second in the list.

The *Cheltenham Looker-on* says, that Prince Albert has fitted up a regular *atelier* in Buckingham Palace, where he has his colors, and canvasses, and models—everything in a true artistic style. His Royal Highness may be considered a very capital painter.

The Light of the Sun and Moon.—The direct light of the sun has been estimated to be equal to that of 5,563 wax candles, of moderate size, placed at a distance of *one foot.* The light of the moon is about equal to that of *one* wax candle at the distance of *twelve feet.*

Velocity of Lightning.—The velocity of lightning has been attempted to be measured by M. Halvig, who estimated it at eight or ten miles a second, or 36,000 miles in an hour. At this rate of travelling, we might compass the globe in somewhat more than half an hour.

The Age of "Invention" is progressing with railway speed. It no longer appears necessary to work hard for a livelihood; fortunes on a large scale may be made readily; and the *otium* may be enjoyed to the full *'cum dignitate.'* The following pleasing advertisement appeared in the *'Times'* of yesterday: —"EIGHTY THOUSAND POUNDS, annually, may be realised in a most *gentlemanly* pursuit, free from partnership, by *venturing* £4,000. No *imaginary speculator* or *sceptic* need apply, as it is essential he should possess adequate means and *fortitude.* References required and given. Letters free, from principals, only attended to, to be addressed to *Omega,* care of Mr. Thomas, 7, Bath-place, Addington-square, Camberwell."—The above is, of its kind, the neatest thing we ever read. We only regret that we have not £100,000 lying fallow, for "investment" in so desirable a scheme. We fear there are more *Alphas* in the world than there are *Omegas,* and that many such opportunities may not again occur.

The Convent Cement.—The inventor of this cement numbers among his patrons, "Her Grace, the Dowager Duchess of Bedford, the Most Noble the Marchioness of Cornwallis, and other ladies of rank." It is adapted equally for cementing card-board, and wood-work; also for mending alabaster, glass, china ornaments, &c., &c. It does not

require to be melted by heat, being in a soluble state, and always ready for use. The ingredients of which it is composed, are perfectly innoxious, and its adhesive powers considerable.

REPORTS OF SCIENTIFIC MEETINGS

ROYAL SOCIETY.

(Continued from our last.)

The following is a continuation of the list of the papers and communications read before the Society during the session 1839 and 1840.

March 26, 1840.—"Researches in Electricity, 17th series; on the Source of Power in the Voltaic Pile." By Michael Faraday, Esq., D. C. L., F. R. S., &c., was resumed and concluded.

April 2.—"Additional Note to the Eleventh Series of Researches on the Tides." By the Rev. William Whewell, B. D., F. R. S., &c.

"On the Nervous System." By Sir Charles Bell, F. R. S.

April 9.—"On the Nervous System." By Sir C. Bell; resumed and concluded.

"On the Constitution of the Resins. Part IV." By James F. W. Johnston, Esq., M. A., F. R. S.

April 30.—His Royal Highness Prince Albert of Saxe Coburg and Gotha was proposed and elected a Fellow of the Royal Society.

The following communications were read:—

1.—A Letter from Sir John Barrow, Bart, V. P., addressed to the President, accompanying a series of Magnetic Observations made on shore, and on board Her Majesty's ships "Erebus" and "Terror," under the direction of Captain James Clark Ross, R. N., together with a series of observations made on the temperature and specific gravity of the ocean, at various depths, and at the surface; namely,

"Observations of the magnetic intensity on shore, and on board H. M. S. Erebus, with needle F. 1.

"Magnetic dip; observations on shore, and on board H. M. S. Erebus, with needle F. 1.

"Observations for the magnetic dip on shore, and on board H. M. S. Terror.

"Observations of the magnetic dip, by needle F. C. 5, on shore, and on board H. M. S. Terror.

"Observations in magnetic intensity by needle, F. C. 5, on shore, and on board H. M. S. Terror."

The whole of these observations are up to the 31st of December, 1839, and transmitted to the Royal Society by the Lords Commissioners of the Admiralty.

2.—Postscript to Major Sabine's paper, entitled "Contributions to Terrestrial Magnetism."

3.—"A few remarks on a Rain Table and Map," drawn up by Joseph Atkinson, Esq. Communicated by P. M. Roget, M. D., Sec. R. S.

4.—"Extracts from a Meteorological Journal, kept at Allenheads, in the county of Northumberland," by the Rev. W. Walton, F. R. S.

5.—"Description of an Astronomical Clock, invented by the late Capt Henry Kater, F. R. S.," drawn up from his own Memorandums by his Son, Edward Kater, Esq., Communicated by Sir J. F.W. Herschel, Bart., V. P. R. S.

May 7.—"Researches in Embryology, third series; a contribution to the Physiology of Cells." By Martin Barry, M. D., F. R. S.

"On the Odour accompanying Electricity, and on the probability of its dependence on the presence of a new substance." By C. F. Schonbein, Professor of Chemistrê, Bâsle, communicated in a letter to M. Faraday, Esq., D. C. L., F. R. S., &c.

May 14.—"Tables of the Variation, through a Cycle of nine years, of the mean height of the Barometer, mean Temperature, and depth of Rain, as connected with the prevailing Winds, influenced in their direction by the occurrence of the Lunar Apsides, with some concluding observations on the result." By Luke Howard, Esq., F. R. S.

"Experimental Researches into the Strength of Pillars of Cast Iron, and other Materials." By Eaton Hodgkinson, Esq. Communicated by Peter Barlow, Esq., F. R. S., &c.

May 21.—"Remarks on the Meteorological Observations made at Alten Finmarken, by Mr. S. H. Thomas, in the years 1837, 1838, and 1839." By Major Sabine, R. A., V. P. R. S., and Lieut. Col. Sykes, F. R. S.

"Second Letter on the Electrolysis of Secondary Compounds, addressed to M. Faraday, Esq., D. C. L., F. R. S., &c. By J. F. Daniell, Esq., For. Sec., R. S.

May 28.—"Meteorological Register, kept at Port Arthur, Van Diemen's Land, during the year 1838, and Register of Tides, at Port Arthur, from August, 1838, to July, 1839, both inclusive." By Deputy-Assistant-Commissary-General Lempriere. Communicated by Sir John Franklin, R. N., F. R. S., &c.

"Notice relative to the form of the Blood-particles of the *Ornithorhynchus hystrix*." By John Davy, M. D., F. R. S.

"Researches on Electro-chemical equivalents, and on a supposed discrepancy between some of them and the atomic weight of the same bodies, as deduced from the theory of Isomorphism." By Lieut.-Col. P. Yorke. Communicated by M. Faraday, Esq., D. C. L., &c.

"Second series of approximate deductions made from about 50,000 observations taken during the years 1836, 1837, and 1838, at the P. Louis Observatory, Mauritius, four times each day; namely, at 8 A. M., at noon, and at 4 and 8 P. M." By J. A Lloyd, Esq., F. R. S.

"On the Solubility of Silica by steam; with an account of an experiment on the subject, conducted in the East Indies, by Julius Jeffreys, late of the Hon. East India Company's Medical Establishment."

June 4. Contributions to the Chemical History of Archil and of Litmus." By Robert Kane, M. D., M. R. I. A. Communicated by Francis Baily, Esq., V. P. R. S.

"On the Corpuscules of the Blood." By Martin Barry, M. D., F. R. S.

June 18.—The President stated that the Council had voted Addresses of Congratulation to Her Majesty the Queen, and His Royal Highness Prince Albert, on the occasion of the late traitorous attack made upon their lives, which were read and unanimously adopted by the Society.

"A Letter was read from G. G. Anson, Esq., addressed to the President, enclosing a specimen of a deposit with which nine acres of land, near Exeter, belonging to Lord Radnor, had been covered, after the subsidence of a flood, and which was sent by His Royal Highness Prince Albert, F. R. S.

"Description of the Specimen referred to in the preceding letter." By John Lindley, Ph. D., F. R. S.

"An Account of Experiments on the reflecting Telescope." By the Right Hon. Lord Oxmantown, F. R. S.

"On the theoretical explanation of an apparently new Polarity in Light." By G. B. Airy, Esq., M. A., F. R. S., Astronomer Royal.

"On the Ferrosesquicyanuret of Potassium." By Alfred Smee, Esq. Communicated by P. M. Roget, M. D., Sec. R. S.

"On the influence of Iodine in rendering several argentine compounds, spread on paper, sensitive to light; and on a new method of producing with greater distinctness the Photogenic Image." By Mr. Robert Hunt. Communicated by Sir John Herschel, Bart., V. P. R. S.

"Hourly Observations of the Barometer and Thermometer at Sea, on the 21st of March, 1840." By Major-General A. Lindsay, H. E. I. C. S. Communicated by Sir John Herschel, Bart.

"On the Constitution of Pigolite, and on the Mudesolus and Mudesic Acids." By James F. W. Johnston, Esq., M.A., F. R. S.

"On the Constitution of the Resins, Part V." By James F. W. Johnston, M. A., F. R. S.

"Researches on the Tides, 12th series. On the Laws of the Rise and Fall of the Sea's surface during each tide." By the Rev. W. Whewell, B. D., F. R. S.

"Researches in Embryology. Third series. Additional observations." By Martin Barry, M. D., F. R. S.

"Description of a Calculating Machine invented by Mr. Thomas Fowler, of Torrington, in Devonshire." By Augustus De Morgan, Esq. Communicated by F. Baily, Esq., V. P. R. S.

"On the minute structure and movements of Voluntary Muscles," in a letter addressed to R. B. Todd, M. D., F. R. S. By Wm. Bowman, Esq., Demonstrator of Anatomy in King's College, London, &c.

*** The Society adjourned over the long vacation to meet again on the 19th of November next.

ROYAL BOTANIC SOCIETY OF LONDON.

July 28. Benjamin Bond Cabbell, Esq., in the Chair.

At the usual meeting of the society, after the election of several new fellows, there was read, by Mr. George Thurtell, a highly-interesting and important paper upon the growth and pruning of forest trees, which was clearly illustrated by numerous specimens brought from Holkham, the seat of the Earl of Leicester, showing the advantage of a natural over artificial pruning. Having given a general account of the growth of trees, both as solitary individuals and as the collective members of forests and plantations, he deprecated the use of close pruning, instancing from the specimens he exhibited, that where the excision is made decay inevitably takes place, and that while nature conceals the wound by forming fresh wood over it, the unsound portion about to become the nucleus of future dissolution, is enclosed within the body of the tree, and thus, that which has the outward appearance of firm and healthy timber, may be in such a state of rottenness in the interior as to be incapable of supporting any ordinary weight. This was proved in a communication which he had received from the late Lord Suffield, who mentioned that in some buildings he had erected, tho rafters had fallen in; here the inside of the wood was rotten, the marks of the saw being distinctly visible within the sound outside, plainly proving that close pruning had been used. By natural pruning Mr. Thurtell explained, that when the lower branches of a tree had performed the duties assigned to them they gradually die off, the tree thus, it may be said, pruning itself; and, contrary to the effects of close pruning, in this case, no decayed wood was imbedded in the new formation of the timber, but all was healthy and sound. In conclusion, he begged to call the attention of the proprietors of woods and forests to a subject which was so important not only as regards the landed interest, but our national wealth.

ROYAL SOUTH LONDON FLORICULTURAL SOCIETY.

The third exhibition for the season took place on the 28th instant, at the Surrey Zoological Gardens, and was not exceeded by that of any previous show. The miscellaneous show was very good, and well merited the liberal awards which were bestowed. There were several good dahlias, although early in the season, and the show of piccotees, the cultivation of which flower is now becoming very popular, exceeded that of any local exhibition. Although late in the season, there was a very good show of roses from the nurseries of Messrs. Paul, of Cheshunt, and Mr. Wood, of Maresfield. In the collections of heartsease, Mr. May, of Edmonton exhibited no less than 800 varieties, most of which were seedlings. One of the tents was devoted almost expressly to the exhibition of this pretty and interesting flower. The cockscombs were likewise very good, and there was a large collection of a class of plants generally overlooked in these exhibitions, those of indigenous growth. Amongst these was a large collection of British ferns from Mr. Iliff, of Newington, which excited much atten-

tion from their peculiar mode of growth. The collection of fruit, particularly of melons, grapes, peaches, &c, was very superior. The prizes awarded were very numerous, large silver medals being given to Mr. Edmonds, for a collection of miscellaneous plants; Mr. Dalton, for roses; Mr. Hall, for the best 12 blooms of carnations; Mr. Barnard, for the best 12 blooms of piccotees; and to Mr. Edmonds, for the best 24 stands of heartsease. The grounds were visited by several thousand persons during the day.

THE THEATRES.

"See that the players be well used."—*Hamlet.*
"Nothing extenuate, nor aught set down in malice." *Othello.*

HER MAJESTY'S THEATRE.—The season is now all but over, Saturday next being the last evening of performance. Indeed, the house is now open only for the "benefits" of the performers. That of Thursday, proved a "bumper" for "our own" CERITO,* whose feats, as she bounded over the stage, with all the grace of a fawn, will not soon be forgotten. She positively out-did all her former efforts; than which we cannot accord her higher praise.

A new ballet was produced for the occasion, called *Le Toreador*, in which were exhibited some good dancing, and some beautiful scenery. The staple was *jealousy*; the mistress being taken, while *en masque*, for the maid, by a gallant Spaniard. In both acts CERITO appeared,—in the first, in a new *pas de quatre*, with Mddle. KEPLER, M. MATHIEU, and Signor GUERRA; and, in the second act, with the latter gentleman in a *pas de deux*. She also introduced a new *Spanish dance*, but it too closely resembled the *Cachuca*, and other similar dances, to be attractive, beyond exhibiting the powers of the *danseuse*. CERITO, in this, was magnificently attired, and as *spirituelle* in her movements as her fondest admirers could desire. She is a beautful "creation," on which the eye and memory love to dwell. Next season, we predict for her very great things. She can demand her own terms, and if she be wise, she will avail herself of her privilege.

Poor LAPORTE has recently been placed in anything but an enviable position with his performers. He is obliged to pay them, *in advance*, immense sums of money; and yet they will never appear unless it quite suits their convenience to do so. LABLACHE, and Madame PERSIANI, are among the more recent delinquents, and the manager has gibbetted them both, by publishing their offences.

DRURY LANE.—To prove that the *Concerts d'Eté*, which we have so often eulogised, possess every possible variety, we record the following as incidental to the performances of Wednesday. At the commencement of the second part of the concert, an individual dressed in a ordinary *blouse*, and quite tipsy, took his place in the dress-circle, and soon attracted attention by pouring forth the foxhunter's cry of "Yoiks, Tally-ho!" Many voices immediately required that he should be turned out, and many others rejoined with a "no, no." Mr. ELIASON, who had reason to apprehend that the music of his band would not subdue the unruly spirit in this Nimrod, considered it expedient, as it appeared, to give directions that the police should take him under their especial care. He again committed some untoward extravagance, by which the persons about him in the box seemed to be considerably excited. The consequence was that the police interfered, and ultimately felt it necessary to try and eject him from the house. He was not at all however a person to yield to such a proceeding, and he met it with both active and passive resistance. He clung violently and with much vigor to the wood-work of the box. The whole audience in the house had its attention drawn to the conflict. Many sympathised with the culprit, discouraged the police, and, at last, tried to scale the box for the purpose of rescue. Whether it was the result of the *impromptu* plans of this party, or that the police felt it to be their own more facile way of getting their man out of the theatre, we do not venture to assert; but the simple fact was, that he was tumbled, head over heels, into the pit, and then again seized. A violent commotion now took place. The police and their captive were pushed about from one side of the pit to the other. A reinforcement of some three or four men came from Bow-street, and the belligerent force of the audience was also augmented. To those in the boxes a most animated engagement was now displayed, in which, occasionally, a most formidable whirling of the police staves was perilously conspicuous. It took at the least ten minutes before the capture could be effected, and the prisoner borne away. Here the matter might have been ended, and should have ended, but the police, with gross indiscretion, returned to the theatre, entered the pit, and drove through the excited assembly in order to seize those by whom they considered they had been assailed in their former proceeding. The consequence was a renewal of battle with aggravated animosity on both sides, and this, to all appearance, ended by the police force being ejected in a very precipitate manner down the wide central stairs of the pit. The whole proceeding seemed brutal in the extreme. We understand, however, that some three or four supposed assailants of the force were by them taken and consigned to the Bow-street cells. The affair did not end here. The pittites, when thus seemingly victorious, turned their attention to Mr. ELIASON, as he tried to lead Haydn's "Surprise" (!) and assailed him with violent animadversions, to which he tried in vain to give a satisfactory reply. He, however, offered to go the police-office and bail out, if possible, the original cause of all the uproar. He went, and was obliged to return with the information that the hero in question was so overcome with tipsiness, and probably his late exertions, as to be quite unfit for a state of freedom. This left the malcontents in *statu quo*—the concert could not go on—"God save the Queen" was played, but in vain, to restore calm; and at length the musicians retired from the scene where they could produce no efficient harmony.—"*Sic transit gloria* Wednesday!"*

HAYMARKET.—Most sincerely and most fervently do we congratulate the play-going public, on the departure of Charles KEAN for the provinces. He has committed murders so many, and so foul, on the productions of our Immortal Shakespeare, for the last two months, that it will require a very long time indeed to blot their remembrance from our theatrical annals. The last act of madness and presumption of which Mr. KEAN was guilty, was his "attempt" to delineate the character of *Shylock* for Mrs. HUGHES' benefit on Wednesday. As, however, we never criticise the performances on a "benefit night," (on which occasions we hear, see, and say nothing,) we give him the "benefit" of the general rule, and make no further allusion to his demerits. That he has left us, we record with unfeigned pleasure. MACREADY will now shine forth in all his glory; he is announced to play a round of his favorite characters. HARRISON and Miss RAINFORTH, in the *Beggar's Opera*, draw excellent half prices, and we may safely predict to the worthy manager a prosperous career to the end of his season. We shall have lots of novelties to record, anon.

NEW STRAND.—The revival of the excruciatingly-comic burletta, *Behind the Scenes*, on Monday, introduced us to our old friend, ATTWOOD, whose entrée was *hail*-ed with a *storm* of long-continued shouts of applause. He played with all his usual vivacity, and kept the house in one continued roar. The other pieces produced last week, have been repeated every evening.

ASTLEY'S.—This establishment requires no aid from us. *The Siege of Troy*, and Mr. CARTER'S wild-tame animals, are attracting half London.

THE OPERA.—Her Majesty's Theatre, as we have elsewhere stated, will close for the season on Saturday, when the management will have given the usual number of subscription nights, viz., fifty. The season has been unusually brilliant, and has afforded a handsome profit to the moneyed speculators who lease the establishment, after deducting the salary to the director (M. Laporte). The prima donna, Giuletta Grisi, accompanied by Ernesta Grisi and M. Benedict, depart on a provincial tour, on the 16th and 17th. They give concerts at Leamington Spa. Cerito, who is indeed a most formidable rival to Taglioni, and a Goddess in her own right, will leave for Stuttgardt, where the manager of the royal theatre in that capital has engaged her, by direction of His Majesty the King of Wirtemberg. Madame Persiani goes to Paris, where, we are sorry to hear, her only son is in very ill health.

THE "SHAKSPEARIANS."—We were attracted to Her Majesty's Theatre on Monday, by the announcement of a second performance of the *Jew of Capua*; the characters, by the Shakspearians. Knowing these same Shakspearians to be very clever fellows, we expected much intellectual entertainment, and we anxiously awaited the rising of the curtain. Our surprise may be imagined, when we state that a *broad farce* was the first item in the bill of fare, and *Katherine* and *Petruchio* the second. We are bound to speak well, nevertheless, of the performers, who played with much ease, spirit, and *goût*. In the former piece, the gentleman who played the old uxorious fool deserves very honorable mention. GOLDSMID, as the servant, was droll, but most unbearably and offensively vulgar.

In *Katherine* and *Petruchio*, we had two very, ably and pleasing representatives of those characters. The lady is not young, nor handsome but plays admirably and looks well on the stage. *Grumio* was half inclined to be funny, but the effort was too much for him. The house was well filled, and the company were, for the most part, highly respectable.—A word to the worthy committee. Why do they place two such impertinent ruffians at the pit entrance? The insolence with which these creatures turned people back who were not dressed according to *their* fancy, was worthy of personal chastisement, and, on several occasions, it was very near being administered. We saw many individuals insulted because they were habited in perfectly *white* trowsers,—every thing else being unexceptionable. The weather was intensely hot, and we maintain a ready admission ought to have been granted. Either *white* or black trowsers are dress in summer. We saw one of the committee on the subject—being ourself one of the rejected—and we need hardly say that he instantly ordered our admission, to the inconceivable consternation of his menials.

M. BERLIOZ'S FUNERAL MARCH.—M. Berlioz has added another laurel to the wreath which already encompasses his brow, by the composition of the music to be performed to celebrate the funeral obse-

* We have heard, since writing the above, that CERITO was not entitled to one farthing of the receipts on this occasion; and that her *name* was made use of as a decoy-duck! As we have this on very good authority, we feel bound to believe it. Of such a measure, on the part of the management, we shall not trust ourselves to say what we feel. No observations of ours could meet the case. It is heartless, cold-blooded, and sordid to the last degree. The lovely sylph herself took it all in good part; and never did we see her dance with more grace, loveliness, and agility. The adoration of her patrons, so unequivocally expressed, must, on this occasion, have given her quite as much pain as pleasure; yet did she receive the garlands, as they fell in multitudes at her feet, with all the witchery of a Goddess. How very differently some persons would have acted, under similar circumstances! But CERITO is to be pitted against TAGLIONI next season; "aye, there's the rub," and she must *pay* for the "honor."

* Mr. Twyford, the Magistrate of Bow-Street, fined the "gentleman in the blouse" £5, on Thursday. On his exit, it was discovered that he had handed over 5 Napoleons; he had, we suppose, deducted 16s. 8d., by way of "discount for cash!"

quies of the victims of July, and which was rehearsed at the concert rooms of the Rue Vivienne. The composition in all its parts is of such magnitude, that it would require more than one hearing to appreciate its effects as they deserve; we, therefore, undertake to record the impression it produced upon the mass of the large assembly present, and on ourselves. It opens with a funeral march, that singularly and happily blends a solemn and melancholy strain, with a well-preserved military character. The opening is a martial movement, in the key of F minor, introduced by a funeral roll of drums, and a few bars of trumpets and horns preceding the full instrumentation, which is continued, supported, and varied throughout with masterly skill—now swelling into a loud strain of lamentation—now sinking into a loud wail for the dead, with felicitous power of expression. A novel effect is produced by an imitation of musketry and artillery, forcibly illustrative of the composer's subject. The movements, comprising the funeral march and *Apotheosis*, rise, we think, however, even above the first, in both conception and execution. A recitative, written for the trombone, early breaks upon the ear, in a strain of musical eloquence of the most touching character; in a fitful changement of measure to $\frac{3}{4}$, the bassoon joins it with a delicious effect; presently, as if in reply, a choral strain seems to rise from the instruments, that really requires only voices to complete the delusion. But the grand effect is not yet produced; the composer has not prematurely lavished his means, but summoning them all for his conclusion, pours them forth with magnificent effect, in an immense burst of military grandeur of the most sublime character. The entire of a most powerful brass band, with the trumpets predominating, strike out this new subject, and soon, by the employment of all the means at the composer's disposal, a superb combination of harmony carries the hearer irresistibly away. This concluding piece roused the enthusiasm of all present, and was frequently interrupted by bursts of irrepressible applause. We repeat, however, that it is impossible after only a single hearing of this astounding composition, to point out all its beauties, but as they become more known, so will M. Berlioz's triumph become extended. The execution of the band was creditable, though in some parts, especially where the flutes and clarionets predominated, there was a want of light and shade absolutely necessary to the effects the composer evidently intended, and which somewhat destroyed the perfection of the work. M. Berlioz himself directed the orchestra with inexhaustible energy and effect. —*Galignani.*

ROYAL BRUNSWICK GARDENS, VAUXHALL.—Mr. KING, the spirited proprietor of this miniature Vauxhall, deserves very honorable mention for the entertainment he has provided for his friends and the public. Not only has he catered for them, nobly, in the matter of "refreshment," and all those little *agrémens* of which John Bull is by nature so fond; but he has added "soft strains of music," vocal and instrumental, which, with a variety of other *entremets*, kept up with great spirit, cause him very frequently to be honored with an overflow. The Thames, we should add, runs immediately in front of the Gardens, which are very tastily arranged; and steam-boats are passing to and fro every ten minutes.

ADVERTISEMENTS.

JONES'S PROMETHEANS.—The advantages the Prometheans possess over all other instantaneous lights, are their extreme simplicity and durability, as neither time nor climate can impair their original quality. They are composed of a small glass bulb hermetically sealed, containing about a quarter of a drop of Sulphuric Acid, encompassed by a composition of the Chlorate of Potash, enclosed in Wax Papers or Wax Tapers; the latter will burn sufficiently long for sealing two or three letters. The PROMETHEANS being pleasant to use, and never failing in their purpose, are rendered nearly as cheap as the common Lucifers. To be had of all respectable Chemists, &c., or at the Manufactory, 201, Strand.

COLLEGE for CIVIL ENGINEERS.—NOTICE IS HEREBY GIVEN, that the College has been removed from the temporary premises at Kentish Town to very spacious and airy freehold premises at Putney, the purchase of which has been effected by the Council; and that the Students are expected to reassemble on Thursday the 13th day of August next.

By order of the Council,
J. E. B. CURTIS, Secretary.

Every information as to terms, mode of admission, and the general regulations of the College, may be obtained by application to the Secretary, at the Office.

Office, 9, Villiers-street, Strand.
July 22, 1840.

GENERAL SALVAGE COMPANY.—
Capital £50,000, in 5,000 Shares of £10 each, with £5 paid.

DIRECTORS.

Charles Austin, Esq.	Geo. William Lenox Esq.
Charles Bischoff, Esq.	Charles Pearson, Esq.
W. T. S. Daniel, Esq.	Daniel Quarrier, Esq.
Jas. P. Gordon, Esq.	Lestock Peach Wilson, Esq.

BANKERS—Messrs. Prescott, Grote, Ames, and Co.
SOLICITORS—Messrs. Martineau, Malton, and Trollope.
SECRETARY—Mr. William Lee.
Temporary Offices, 14, Bucklersbury.

The chief object of this Company is the recovery of sunken vessels and cargoes, for which purpose certain most important inventions have lately been made and patented, and the exclusive ownership secured to the Company; the principle of these inventions is simple, the efficacy certain, and to secure success, the only thing necessary is to provide for the due application; with this view, experiments upon a most extensive scale have been instituted, under the superintendence of the Directors of this Company, and the result of such experiments has proved the great value of these inventions.

The facts established in the Report of the Committee of the House of Commons, relative to shipwreck, No. 567, page 3, printed 15th August, 1836, sufficiently prove the immense scope for the operations of a Salvage Company, it appearing therein that during a period of six years, to which that Committee limited their investigations, no less than 2,905 vessels were wrecked or missing; and the amount of losses thereby, was estimated at £14,515,000: and it will be recollected that in the month of January, 1839, nine vessels were stranded in the entrances to the Mersey alone, the value of whose cargoes exceeded £1,000,000.

The Directors have satisfactory proof, that much of the property referred to by the Committee of the House of Commons rests under circumstances favorable for its recovery, being specie, metals, and other imperishable goods, to which the means at the disposal of the Company are certainly applicable, and the continual addition to this accumulation by the disasters daily reported from the coast, leaves no room for doubt that the operations of the Company will prove as extensively beneficial as they are important.

Prospectuses and further information, may be had at the temporary offices of the Company, 14, Bucklersbury, where working models of their apparatus may be seen.

Applications for shares must be made, addressed to the secretary as above, prior to the 31st of August next.

Mining Journal Office, 37, New Broad-street, City, 27th June, 1840.

NEW WORK ON THE IRON TRADE.—The Number of the MINING REVIEW this day published, contains the Sixth Part of the Paper on the IRON TRADE, by Harry Scrivenor, Esq.—this work will be completed in Twelve Monthly Parts, and so arranged as to form a separate volume at the end of the year; in addition to which the MINING REVIEW contains—A Paper on the Establishment of a School of Mines—On the Ventilation of Mines, by Samuel Moyle, Esq., C.E.—On the Preparation of China-Clay, by W. J. Henwood, Esq., F.R.S., &c.—On Blasting Limestone Rock, being an Account of Blasting the White Limestone in the Country of Antrim, Ireland, by William Bald, F.R.S.E., M.R.I.A.—On the Applicability of Peat to Manufacturing Iron—Parliamentary Returns of the Imports and Exports of Copper, Lead, and Tin, for the year ending 5th January, 1840—Scientific Bodies, &c.—The MINING REVIEW is published at the office, as above, on the 1st of each month, price Sixpence.

The MINING REVIEW is also furnished, to subscribers, as a Monthly

GRATUITOUS SUPPLEMENT TO
THE MINING JOURNAL,
RAILWAY AND COMMERCIAL GAZETTE,
Forming a complete Record of the Proceedings of all Public Companies.

The "MINING JOURNAL" is the only newspaper exclusively devoted to Geology, Mineralogy, and Metallurgy; combining therewith reports of the proceedings of all public companies, correspondence from the English and Foreign mining districts, sales and purchases of ores, prices of metals and materials, prices of English and Foreign funds, shares in mines, railways, joint-stock banks, canals, &c., with parliamentary summary, London Gazette, and much original and interesting scientific intelligence, &c.; forming an invaluable record of every occurrence relating to mines, railways, joint-stock banks, &c.

The "MINING JOURNAL" is published at two o'clock every Saturday afternoon, at the office, 37, New Broad-street, City, to which address all Advertisements and Communications are requested to be addressed. Price 6d., and may be had of all booksellers and newsvendors in town and country.

IMPERIAL PATENT WOOD PAVEMENT COMPANY.—Notice is hereby given, that the SUBSCRIPTION LIST will be CLOSED on the 15th day of August next, after which no further applications for shares will be received.

By order of the Provisional Committee.
S. M. COOPER, Solicitor and Secretary.
9, Old Cavendish-Street, Cavendish-Square, July 29.

HOLMES'S PATENT, for IMPROVEMENTS IN THE CONSTRUCTION OF IRON SHIPS, BOATS, AND OTHER VESSELS; also in Means for Preventing the same from Foundering, also in the Application of the same Improvements or parts thereof to other vessels.

"All persons who examine this patent, must admit Mr. Holmes to have fully established the principles insisted on in his report to the East India Committee, in 1838, of the practicability of building iron ships without limits to size, and on the indispensable necessity of the adoption, not only of much larger ships than had been contemplated, but that it was equally indispensable, in point of profit, that they should be built of iron, and by the adoption of his improvements a great reduction in the first cost of wear and tear would be effected. Many parts of these improvements are, however, equally applicable to wood ships, as regards safety to the passengers; and wherever they are adopted, we cannot conceive any case or circumstance in which a ship can be placed in danger. In the fullest sense of the word, they become life-boats, without waste of room, or extra cost."—*From the "Inventors' Advocate," July 4.*

Applications for licenses to be made to Mr. HELPS, 21, Cornhill, London, or to Mr. HOLMES, Civil Engineer and Naval Architect, 5, Cannon-row, Westminster, where Plans and Specifications are prepared, with every practical detail for the Builder's Contracts for every Class of Iron Vessels.

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SCIENTIFIC INSTITUTIONS OF RUSSIA.

Russia is generally known only as a political power. Little is known of her literary and scientific institutions, of the circumstances of their foundation, their existing condition, or of the rank they hold among other European societies. The ambitious views of the cabinet of Russia upon Turkey, and her implacable vengeance to unfortunate Poland, are the chief indications of the existence of the colossal empire of the Czars, that are commonly recognised. It would seem that, in general estimation, the Russians of 1840 bear the same relation to the people of central Europe as the hordes of Brennus did to the people of Rome. The statements we are about to give, however, will show that these sentiments are founded in error, and that Russia has made great advances in scientific knowledge during the past century.

When Peter the Great was in Paris, he conceived the idea of forming an institution, similar to that of the Academy of Sciences, in the capital of his empire. The Academy having deputed Leibnitz to assist him in this design, he had long conferences on the subject with that philosopher. Leibnitz appeared to have been destined to assist sovereigns in these undertakings, for in 1700 he aided the Elector of Brandenburgh, afterwards King of Prussia, to establish the Royal Academy of Berlin, of which he became president. It was on this occasion, on being asked the object of such institutions, that he made that well-known reply: "The object ought to be to promote the happiness of mankind, which consists in the first place in the attainment of wisdom and virtue; and secondly, in possessing health and the conveniences of life."

On the 28th of January, 1724, Peter the Great signed the rules for the new Academy. Foreign men of science were appointed to assist in the undertaking, and courses of lectures were to be delivered in all branches of science. The delays attending the organisation of an institution so entirely new in Russia, prevented its founder from seeing it accomplished. Peter died before the Academy held its first sitting. It was in the year 1725 that the society was definitively constituted. During the reign of Peter II. it was neglected, but in the reign of the Empresses Ann and Elizabeth, it received additional encouragement. In 1745, the encouragement of the fine arts was added to the other objects of the institution. Catherine II., however, founded a distinct society for the fine arts, and augmented the revenues of the Academy of Sciences; which was then composed of four classes, divided in the following manner: one for mathematics, one for mathematics applied to philosophy, one for astronomy, and one for philosophy, natural history, chemistry, and anatomy. The number of members was eighteen, and, among other distinguished men, the celebrated Euler was a member.

When the Emperor Nicholas ascended the throne, he endeavored to increase the influence of the institutions for public instruction, literature, and science; but the improvements he then introduced in the regulation of those institutions were only the forerunners of more important reforms. In 1836, new statutes were made for the regulation of the academic bodies. Up to that time, the labors of the Academy of Sciences had been limited to quietly registering the principal discoveries made in other parts of Europe. The discoveries which the Academy itself had made, were not, with the exception of those of Euler, either very numerous or important. The duties imposed on the society by the Emperor Nicholas, were to extend the bounds of all human knowledge, to diffuse instruction by giving it a direction analogous to the public interests, to teach the application of useful theories, to discover the means of increasing the abundance of the products that constitute the objects of national commerce and industry, and to improve the modes of manufacture in use in the different manufactories of the empire. In order to discharge the duties which were thus imposed upon the Academy, it was directed to pronounce its opinion on all questions of science that might be proposed; to answer questions addressed to it by manufacturers, to whom its advice might be useful, to inspect all machines and inventions submitted to examination; and, finally, to make the government acquainted with all discoveries, the application of which might offer any advantages. The Academy of Sciences of St. Petersburg was composed of 121 members, divided into three classes; that of mathematical science, natural science, and historical and political science. The sum of 240,000 francs was annually granted to it by the government.

The labors of the Academy may be divided into two branches. The first branch comprises those investigations which it is bound to undertake from its connection with the government, and which relate to the application of science to the public good. The other branch comprises the personal labors of the members of the society; the observations made by each one on his own suggestion, the results of which are communicated at the sittings of the Academy in the form of memoirs. To this second branch of the Academy's labors, belongs the duty of reporting the correspondence of the Academy with foreign societies, as well as drawing up instructions for scientific voyages, undertaken under the patronage of the Academy, and the arrangement in order of the series of observations that result from those voyages. In 1826, the Transactions of the Academy formed a collection of 73 volumes; a new series commenced from that date.

In addition to its regular occupations, the Academy of Sciences at St. Petersburg has superintended the publication of many important works. It is under the auspices of the Academy that the Flora of Russia has been published; the foundation of which was laid by the celebrated naturalist, Pallas.

One of the most remarkable expeditions undertaken at the recommendation of the Academy, was the archeographic expedition, undertaken for the purpose of uniting in one collection all the sources of natural history. Russia had no complete documents that could serve to establish the chronology of her former history. The Emperor Nicholas determined to supply this deficiency, by collecting all the historical, judicial, and diplomatic materials that were dispersed in different archives and libraries. The Academy was commissioned to trace the plan of this undertaking, the execution of which was confided to one of its correspondents. Furnished with an order from the Emperor, which procured access not only to the archives and the libraries of the government, but also to those of convents and churches, the person to whom the commission was given traversed the different provinces of the empire, and collected a rich harvest of materials of great interest. A commission was appointed to arrange and publish the documents.

Some scientific men, selected from among the members of the Academy, always accompany the military expeditions of Russia, so that science may derive benefit from the conquests of the Russian army. The experiments relative to the declination and the inclination of the needle, and the intensity of the magnetic power, in the countries of Elborus and Caucasus, were made under those circumstances. Two members of the Academy were added to the mission which the Greek church sent into China, and they were instructed to make careful astronomical, magnetic, and meteorological observations. The results of their expedition amply rewarded the cost of it to the government, for they collected, in addition to a number of facts highly interesting in a scientific point of view, a great quantity of very remarkable specimens of natural history.

The problem whether the level of the Black Sea is higher than that of the Caspian, the solution of which had been a subject of discussion for more than a century, was one of the objects towards which the Academy directed its attention. It was determined to neglect no means by which to ascertain in the most accurate manner the correctness of the opinions previously given on that subject. Three of its members were instructed to proceed to make new experiments, and the Emperor bestowed a gift of 50,000 roubles for the prosecution of the undertaking. The result of these researches will be known in a short time.

The Academy of St. Petersburg has lately been much engaged in the study of the ancient languages, especially those of the east. It is known that a great number of Arabian, Turkish, and Persian works are in existence, which are not to be found in any European library. The Academy has been ordered to draw up a catalogue of the works that it would be important to recover, and which it is supposed are to be found in Southern Asia. The first part of the catalogue has been published. It contains the titles of about one hundred works principally relating to history and geography. Some copies of it have been sent to the authorities on the frontier of Oremburgh, with orders to circulate them by all possible means, and even to give them to the conductors of the caravans into Asia, in the hope that some of the works may thus be discovered.

The Academy of Sciences at St. Petersburg has its annual public meetings for the purpose of establishing a connection between the first learned body in the empire and the more enlightened portion of the population. Some individuals have followed the noble example set in France by the late M. de Monthyon, and M. Paul Demidoff has given every year, since 1831, a sum equal to 20,000 francs for the foundation of four prizes awarded by the Academy to the authors who have enriched Russian literature by the most important and most useful works. The Academy possesses many fine literary and scientific collections. Its library now consists of 90,000 volumes. Among other rare works, it contains a Russian Bible, printed in 1518. The Asiatic museum, founded in 1825, consisting of different collections of objects connected with the literature, the antiquities, and the arts of the east, is attached to the Academy of Sciences. This museum contains about 3,000 small Chinese printed books. There are also upwards of a thousand Persian, Arabic, and Turkish manuscripts, which were purchased in 1819 by the Russian government, from the Consul-general of France. The collection of medals and Mahometan monies amounted in 1817 to 13,000 pieces, and the collection has been since considerably increased, especially in 1828, when, among the indemnity money paid by Persia to Russia, there were found large gold and silver medals of great interest. This Asiatic museum is unique of its kind, in consequence of the richness and diversity of the objects it contains.

The Egyptian museum, which also belongs to the Academy, though by no means equal to that at Paris, possesses, nevertheless, a great number of valuable specimens. A new museum is forming at the present time entirely by voluntary contributions, comprising every remarkable object that Russia affords in connection with history in general, and the natural sciences.

It is well known that the observatory of St. Petersburg is one of the most important in Europe, from the great perfection of its instruments, which have been collected at great expense. It is also to Peter the Great, that founder of all things in the Russian empire, that the honor is due of having created the first establishment for astronomical observations. Though of small importance in its origin, it gradually increased in magnitude, especially during the reign of Catherine II., who honored it with her special protection. The present observatory, which has no equal either in situation, or in the excellent arrangement of its interior and exterior places appropriated for observations, was begun in 1834, and was finished in four years. The erection of the buildings alone cost nearly two millions of francs. To prevent any obstruction to the astronomical observations, it has been ordered that no building shall be erected within a certain distance of the observatory. About 250,000 frs. have been expended in purchasing new instruments, which were made for the most part in Germany.

St. Petersburg also possesses a literary society called the Royal Academy of Russia, its special object is to endeavor to diffuse a taste for national literature. It was instituted in 1785. During the reign of Catherine II., women generally assumed pre-eminence both in public and private affairs. The Princess Daschkow, whom Voltaire called a Tomiris speaking French, and who in all her tastes and behavior resembled a man more than a woman, was made director of the Academy of Sciences, and president of the Imperial Academy. It is asserted by contemporary authors, that she asked Catherine for a colonelcy in the guards, but this appointment was refused. It appears, that not being successful in obtaining the command of soldiers, she wished to manage the academicians in military fashion. She would not allow the hall where the academicians assembled to be warmed in the depth of winter, and yet she expected that every one of the members should regularly attend the meetings. She was always there herself, wrapped round with rich furs; and it was a curious exhibition to see this woman seated in the midst of the bearded Russian professors, who were trembling before her.

Catherine undertook the compilation of a dictionary in 300 different languages. This project which, so far as her own efforts were concerned, was soon so given up, was committed by her to the learned Pallas, who had the boldness to continue it, out of policy, knowing full well the impossibility of completing it. The Academy, however, resumed the task, and collected 273 words, used in 200 different languages. Though this result was very different from the original design of Catherine, it was published, and the *Comparative Dictionary*, poor as it is, was printed. The Imperial Academy is engaged at present in preparing the third edition of its alphabetical dictionary, and in its researches relative to various Sclavonic idioms. The Imperial Academy comprises 57 actual members, and twelve honorary members; its library contains 12,000 volumes of printed works, and 200 manuscripts.

These two Academies are the principal learned societies of Russia.

EAST INDIA COTTON.

The measures which have been taken by the Directors of the East India Company to extend the cultivation of cotton in India, have attracted no inconsiderable attention in the southern parts of the United States. A communication received from Carolina, states that the southern planters were becoming exceedingly uneasy at the progress of the Commissioners sent out by the Company (and who have returned to this country) to obtain information on the best mode of growing the cotton plant. It was known in the United States, that the services of several most intelligent and experienced persons had been secured, and with the vast extent of soil and climate, and great pecuniary resources at the command of the Company, the planters augur nothing but success from the patriotic undertaking. "It is clear (continues our informant) that if cotton should be produced extensively in India, where labor is plentiful on the spot, and cheaper than in any other part of the world, the manufacturers of England may be supplied far below the costly productions of the American slave states, and in this case the cotton states must go out of cultivation." It is true that many political economists of the Union predict a marked decrease in the imports of British manufactured goods, should the demand for cotton fall off, but they also contemplate with pleasure the prospect of becoming independent of any foreign country for supplies of clothing, and anticipate the establishment of manufactories on an enlarged scale in the Northern States, which would then become the best customers to those of the South. England however can produce goods at one-half the cost, and all classes must submit to be heavily taxed by prohibitory duties to encourage their native industry. On the other hand, we gain an increase of trade with our Eastern possessions, which, if rightly fostered and appreciated, would be likely to be of incalculable benefit, both to the inhabitants of the mother country and the millions of our brethren in India, while the slave trade in America would receive a serious, and, perhaps, even a final blow. We are happy to learn that the gins and other machinery necessary in the preparation of cotton, and brought to such perfection in America, have been obtained by the agents of the East India Company, and will shortly be taken by them to their new destination. They have been already offered to the inspection of the curious and scientific in the manufacturing districts, who may possibly, from their practical experiences, offer some valuable suggestions for their improvement. —*Observer.*

THE SULPHUR QUESTION.

To the Editor of the "Inventors' Advocate."

Sir,—Allow me to call your attention to the Sulphur Question. It is reported to be settled, and manufacturers have been expecting that, on the monopoly being broken, we should again be able to get supplied with sulphur at a cheap rate. That, I fear, is not likely to be the case, as the king has levied a duty of £4 10s. per ton on all exported. Why, let me ask, is this country obliged to have any foreign sulphur, when abounding in minerals containing from 30 to 60 per cent of sulphur? Many of the alkali manufacturers are using nothing but pyrites, for the production of their acid. If available for them, how is it that the crude brimstone is not extracted, and brought into the market in that state? The mode requisite is neither complicated, nor expensive, where coal can be obtained cheaply.

I am, Sir, yours obediently,

Aug. 11, 1840. PYRO.

EXPIRED PATENTS.

PATENTS THAT HAVE EXPIRED DURING THE WEEK ENDING AUGUST 8, 1840.

ENGLAND.

JOHN WILLIAMS, ironmonger and ships' hearth manufacturer, and JOHN DOYLE, mechanist, both of the Commercial-road, *an apparatus and process for separating salt from sea-water, and thereby rendering it fresh and fit for use*, Aug. 4.

SPECIFICATIONS.

A LIST OF SPECIFICATIONS

ENTERED AT THE ENROLLMENT OFFICE, UP TO THE WEEK ENDING AUGUST 8, 1840.

(Continued from page 83.)

ENGLAND.

PHILIPPE MARIE MOINDRON, Bedford-place, Russell-square, *improvements in the construction of furnaces and in boilers*, July 31.—These improvements are with a view to bring into action, more fully than is now practised, the useful properties of caloric, by

the combined using of polished reflecting surfaces and non-conducting materials, by which means the heat evolved is reflected on to the surface of a boiler or other apparatus. The heat is prevented from passing away without fulfilling the duties to which it is applied.

First, to envelope the boiler or other apparatus with a reflecting surface, at such a distance that the heat can pass between the reflecting surfaces and the surfaces to be heated, but in so applying reflecting surfaces, care is to be observed in arranging the same, that they may be conveniently got at from time to time to be polished.

The materials employed for obtaining heat, when working the invention, are combustible gases and spirits, or fatty matters, which are consumed by burners or lamps.

The boiler is placed on a frame that will allow the gas flame, from three or more concentrical and perforated rings, to pass round; the outer casing is made of any non-conducting material, and the lining nearest to the boiler consists of polished steel; the draft of air below supports combustion.

Tea-kettles, or other culinary articles, may be encased with this reflecting surface and non-conducting material, whereby is obtained great economy of fuel and heat.

SAMUEL CARSON, Caroline-street, Coleshill-street, Euston-square, *improvements in apparatus for withdrawing air or vapor*, Aug. 5.—The inventor states, that revolving heads with cones have been applied to chimneys, in order to improve the draft thereof, but in such case the cones have not been made of sufficient length to pass beyond the opening of the chimney or shaft; hence the same has been of little use, owing to the wind being blown down the chimney.

First improvement is for withdrawing heated air from chimneys or shafts, by means of the atmospheric air blowing through a cone, situated in a cylindrical box that revolves, at the chimney top, by the aid of a vane or weathercock; the wind passing through this cone, the orifice of which extends beyond the opening of the chimney or shaft, causes by its attraction or draft the smoke from the fireplace, or rarified air of the chamber, to rise with velocity, and pass round the casing connected to the chimney by a revolving joint.

Second improvement consists in bringing the pipe that is to carry off the condensed or heated air of an apartment, down to the conical apparatus situated near a jet of steam, or near the waste steam-pipe of a boiler. In place of the atmospheric air passing through the cone, a jet of steam is made to draw off the confined air of the chamber, or from the bottom of a mine.

Third improvement is to introduce a jet of steam into a chamber, without the use of a cone, whereby the vacuum is produced, and the confined air passes up from the mine or chamber through the valve at the upper orifice of the tube.

This improvement we have examined at the Polytechnic establishment, where it works beyond all expectation, and we have since learned that Mr. Brunel has allowed Mr. Carson to introduce it at the Thames tunnel, where a four-horse engine cannot sufficiently ventilate the shaft; by this improvement, the waste steam alone will perform the whole operation.

WILKINSON and PATRICK SANDERSON STEELE, manufacturing and furnishing ironmongers, George-street, Edinburgh, *improvements in kitchen ranges for culinary purposes, and apparatus for raising the temperature of water, for baths and other uses*, Aug. 5.—The inventor claims the use and application of a boiler for the purpose of economically heating a greater quantity of water than has hitherto been effected by the ordinary range boilers in general use. Also the heating apparatus, and its connection with the reservoir, for the purpose of storing up a large body of hot water, and the application of the jointed pipes to the said reservoir, and its float ball and regulating weight, for the specific purpose of drawing off the hottest water for supplying baths or other purposes, as well as the peculiar method by which the boiler is cleaned; and, lastly, the application of the whole for the purpose of heating the hot-plate ovens.

The boiler is simply extended to rise above the fire-place, and two pipes leading from a tank, connected with a bath, are introduced into this boiler, whereby the pressure of water, through the pipe of larger bore, from the tank, causes the heated water to pass up the pipe of smaller bore, which leads into the bath situated in any part of the building. The pipes may be of lead until above the lintels of the jambs near the boiler, when copper or other metal is used.

The bottom of the boiler has a valve held down by a lever and ball, where a pipe leads to the drain below; thus, by raising the lever with its valve, the dirty or cleansing water passes off into the waste.

The hot-plate chamber, or ovens, have the flue passing round them, while the heated atmospheric air is admitted within, and passes between the shelves formed like trellis work, and through an orifice into the chimney, thus giving an equal temperature to the whole.

JAMES HANCOCK, No. 1 and 2, Sydney-square, Mile End, *a method of forming a fabric or fabrics applicable to various uses, by combining caoutchouc, or certain compounds thereof, with wood*, Aug. 8.—The base of this fabric consists of platted whalebone, wood, or other vegetable or animal fibrous material; or the inventor employs a woven wire fabric; these materials are immersed in a compound, and are coated by felt, saturated in the same mixture, which is made as follows:—A quantity of caoutchouc is dissolved in coal tar, or oil turpentine, and then passed through an iron strainer; add this solution in the proportion of 1 to 11 of equal quantities of pitch and Archangel or Stockholm tar, heated in a steam bath. When the felt has been well saturated with this mixture, it is placed over the whalebone, wood, or wire fabric, and is then pressed and dried, when it becomes suitable for sheathing of vessels, covering the roofs of buildings, or other such like purposes.

ENTERED AT THE ROLLS CHAPEL OFFICE, UP TO THE WEEK ENDING AUGUST 8, 1840.

(*Continued from Page* 84.)

ENGLAND.

CHARLES WHEATSTONE, Conduit-street, Hanover-square, and WILLIAM FOTHERGILL COOKE, Sussex Cottage, Slough, *improvements in giving signals and sounding alarms at distant places, by means of electric currents*, July 21.—First claim is for employing the attractive force of occasional or temporary magnetism, which is excited in soft iron by means of electric currents, transmitted through metallic circuits for the purpose of alternately exciting and ceasing to excite by such magnetism any such motion of a hand or other indicator, for pointing to characters on a fixed dial, as will qualify that hand or indicator for exhibiting those characters in a suitable manner for giving signals, or of producing such motion of a dial, with characters thereon, as will qualify that dial for exhibiting those characters in a suitable manner for giving signals.

Secondly, he claims the improvement, which is called a communication, for alternately making and breaking any such metallic circuit, as is suitable for the transmission of electric currents in spiral convolutions around masses of soft iron, so as to excite occasional or temporary voltaic magnetism in such masses, whenever the said circuit is made, and cessation of that magnetism, whenever the said circuit is broken, in order by such alternate making and breaking of the circuit, as many times in succession as required, to obtain alternate excitement and cessation of the said magnetism, for the purpose of producing motion of a hand or a dial.

Third claim is the improvement for sounding alarums in distant places, by aid of machinery, which is kept in continual motion by any suitable maintaining power, that motion being kept regulated as to speed by any suitable kind of regulator, and which machinery, at regular intervals, by raising a hammer or other like means, strikes with sufficient force for releasing the detaining detent of the wheel-work to its alarum, provided the blow was struck on that detent, but which it is prevented by some suitable stop from doing, unless the end of a magnetic needle is interposed between such detent and the hammer, so as to transmit the blow thereof to the detent, and release the same, in order to sound the alarum.

It would require the aid of drawings, to give a full explanation of these improvements, but on referring to No. 40 of this work, the electro-magnetic improvements of Mr. Taylor will no doubt give an idea of the method of working the machinery for alternately exciting, or ceasing to excite, the indicator or the alarum. The only difference will be the length of wire along which the electric fluid is made to pass.

CROFTON WILLIAM MOAT, 14, Thistle Grove, Brompton, *a new and improved method of applying steam power to carriages on ordinary roads*, Aug. 5.—This improvement consists in certain novel constructions and arrangements of the boiler, engines, and carriage intended to be propelled on ordinary roads.

First, is the peculiar mode of supporting the engine and propelling apparatus upon one pair of wheels, and of supporting the carriage or receptacle for passengers and luggage on another pair of wheels, with the manner of connecting them. The running wheels being of considerable diameter, are made to carry, by suitable bearing springs, the boiler, within which are situated two furnaces, and the flues from thence pass through the boiler and the steam-chamber; a pipe with its orifice near the upper part of the boiler, carries the steam to the respective working cylinders, the pistons are connected to a double throw crank; and upon the axle of the driving, which is much smaller than the running wheel, eccentrics are fixed to work the pump that forces the water from the tank to the boiler. A vertical screw is used for the purpose of regulating the relative bearings or weights of the engine on the running wheels.

Secondly, the method of applying the propelling power to the front pair of wheels, or to a central driving wheel, placed under the axle of the front wheels.

Third claim is the manner in which the fore wheels are enabled to turn, independently of each other. Two working cylinders are adapted to each running wheel, and are placed at right angles to each other, one horizontal, the other perpendicular, whereby a toothed wheel takes to the pinion of the running wheel, and causes them to be driven independent of each other.

There is a modification of the boiler, but scarcely worth an explanation.

ENTERED AT THE PETTY BAG OFFICE, UP TO THE WEEK ENDING AUGUST 8, 1840.

(*Continued from No.* 49.)

ENGLAND.

GEORGE CLARKE, Manchester, Lancaster, manufacturer, *certain improvements in the construction of looms for weaving*, July 23.—The principal object of this invention, is to employ an endless chain or belt of tappets, as a mechanical agent for shifting the harnese or healds; and consequently, shedding the warp threads; these tappets are so arranged that they may be varied in their pointing with little or no trouble; thus, the "reading on" of the tappets is facilitated for the purpose of changing the figure or pattern of the fabric.

The endless chain or belt consists of a number of bars or ribs, with holes along their surface, into which the tappets are placed, according to the figure or pattern required. This endless belt is put on

a grooved roller, situated at one end of the driving shaft, and then passes over a grooved tension roller at the upper part of the machine; the inner surfaces of the bars or ribs on the endless belt, act as cogs, which take into the grooved rollers, by which means the shaft, in revolving, will carry round the belt with its tappets, the ends of which strike the projecting parts of the treadles that are weighted at one end, when the reverse ends will pull the wires connected with the harness or healds, and consequently the shedding of the warp threads is varied according to the position of the tappets.

There is a modification of this improvement, which consists in the conical shape of the tappets, for working the "top jacks" and "bottom jacks" of figured looms.

HENRY PHILIP ROUQUETTE, 14, Mark Lane, *a new pigment*, July 25.—This pigment is made of oxide of zinc, or what is called "flower," or when zinc is in a state of scoria or sublimate; after being pulverized and sifted, a layer of the same is placed in an iron oven, and allowed to remain until brought to a cherry red heat, when it may be removed and placed into iron troughs to cool. This "flower" must be again sifted and thrown into a tub of water; then, by means of plugs, the water is drawn off, and the sediment must be collected and placed in a slow oven, or exposed to the heat of the sun, to form cakes, which are afterwards ground with oil or tar, as in the process of making white-lead.

THOMAS AITKIN, of Chadderton, Lancaster, manufacturer, *certain improvements in the machinery or apparatus for drawing cotton and other fibrous substances*, July 28.—This apparatus is applied for the purpose of stopping the machinery, whenever any knot or break will appear in the cotton, or when the can will fail to supply the requisite quantity of fibre.

Between the usual large cones or trumpets, and the feeding rollers, are placed small cones or trumpets, situated on jointed levers that have weights projecting at right angles; these levers with their cones are held in a vertical position by the tension of the cotton in passing from the large cones to the feeding rollers; hence, should a knot in the sliver of cotton be unable to pass through the small cone, a break will ensue by the continued action of the feeding rollers, and the weighted end of this lever, with the small cone, will fall on a bell crank, which will, by its forward action, stop the progress of the machine, when the workman can remove the knot and arrange the sliver, so as to keep up a smooth and continuous fibre through the whole process of drawing cotton.

By the same rule, should the can fail to supply sufficient fibre, the weighted lever will drop, and stop the machinery until the can is replenished with a quantity of sliver.

GEORGE EUGENE MAGNUS, Manchester, Lancaster, merchant, *certain improvements in manufacturing, polishing, and finishing slate, and in the application of the same to domestic and other useful purposes*, Aug. 8.—The inventor claims the use or application of slate, for making the frames and legs of billiard tables, baths, mangles, corn bins, taps or cocks for drawing off liquor, &c. &c.

Second claim is for the method of poliahing the slate in a manner equal to the best finished marble. Take 7lb. of linseed oil, 1lb. of amber, ground, 3lb. of spirits of tar, and 1lb. of asphaltum, sufficiently blended together, and then placed on the slate with a brush; thus, after being submitted to a heat of 200 degrees or more, it is left to cool, and then polished with pumice or rotten-stone.

NOTICE.

In accordance with the determination expressed in our 26th Number, of giving one month's clear notice to Inventors, before publishing their specifications, we hereby inform the following Patentees, that their specifications will be published in the "INVENTORS' ADVOCATE" of Sept. 19. Each party will receive, in addition, a *private* communication to the same effect.

Charles Kober, Leeds, cloth manufacturer, due Sept. 7.
Caroline Julia Sophia Cox, Addison-road, Kensington, due Sept. 7.
Joseph Atkinson, Roundhill, near Masham, York, farmer, due Sept. 7.
Robert Molyneux, Southampton-row, Middlesex, due Sept. 7.
William Maltby, Mile End, chemist, and Richard Cuerton, Percy-street, brass-founder, due Sept. 7.
Luke Hebert, Birmingham, civil engineer, due Sept. 7.
Hayward Tyler, Milton-street, Cripplegate, engineer, due Sept. 7.
James Knowles, of Bolton, Lancaster, coal merchant, due Sept. 10.
George Gwynne, Portland-terrace, Regent's Park, due Sept. 13.
William Forrester, of Barrhead, Renfrew, manager, due Sept. 10.
Thomas Peet, Bread-street, Cheapside, due Sept. 10.
Richard Smith and Richard Hacking, of Bury, Lancaster, machine-makers, due Sept. 10.
Etienne Robert Gaubert, Paris, due Sept. 10.
James Hadden Young, and Adam Delcambre, of Lille, France, due Sept. 13.

FOREIGN PATENTS.—BELGIUM.

LIST OF PATENTS RECENTLY GRANTED BY THE BELGIAN GOVERNMENT.

(*Continued from page 357, Vol. II.*)

Moses Poole, of London, represented at Brussels by Dixon, Hotel de Gronendael, a patent of importation for 5 years, for *improvements in combining metals, applicable to the manufacture of pipes and to other purposes, &c., for which a patent was granted to him, Aug.* 20, 1839.—May 29, 1840.

Kessel, J., of Brussels, rue du Bord-du-Verre, No. 12, a patent of invention for 10 years, for *a machine for grinding malt for brewing purposes, and for crushing grain for distilling brandy therefrom*, June 6, 1840.

Semet, Louis, of Ghent, rue des Semences, a patent of invention for 10 years, for *a new process of purifying coal gas*, June 6, 1840.

Mariette, G., of Cheratte, P. of Liege, a patent of improvement for 10 years, to date from May 11, 1840, for *an improvement in the system of pistol, called "Pistolet Mariette,"* for which a patent was granted to him the 11th May last, *and which improvement consists in communicating a rotary movement to the barrel, while the pistol is being loaded*, June 6, 1840.

Transfer of patent to James Fitchen Cox, of Bristol, now at Brussels, Hotel de Flandre, by W. A. Robertson, patent granted May 11, 1838, for *improvements in the process of tanning hides*, June 6, 1840.

Odeyn, Joseph Auguste, of Brussels, Grand-place, No. 2, a patent of invention for 15 years, for *a mechanical means of teaching to write*, June 10, 1840.

Jacquot, François, of Brussels, rue de la Braie, No. 3, a patent of invention for 15 years, for *the manufacture of a conservative color and cement*, June 10, 1840.

Judo, Jean Baptiste, of Antwerp, rue du Fromage, No. 544. a patent of invention for 15 years, for *a new process of civil and hydraulic construction, and for driving piles*, June 10, 1840.

Ogle, Edward Lodge, of Brussels, Place Royale, No. 14, a patent of invention and improvement for 15 years, for *new systems of railroads*, June 10, 1840.

Humfrey, Ch., of London, represented at Brussels by Prince, rue des Carrières, No. 5, a patent of invention for 15 years, for *improvements in the construction of vessels destined to receive certain liquids, or other substances*, June 16, 1840.

Perpigna, Antoine, of Paris, represented at Brussels by Doré, St. Josse-ten-Noode, chaussée de Louvain, No. 24, a patent of importation for 5 years, for *a process of consolidating and preserving ligneous and tertile vegetable substances*, June 16, 1840.

Derny, H., of Nivelles, a patent of invention for 10 years, for *an economical ley*, June 22, 1840.

Touche Gilles, E., of Antwerp, Place Vert, No. 704, a patent of invention for 10 years, for *a stucco for the purpose of preserving from damp*, June 22, 1840.

De Bruyn, Francois, of Brussels, rue de la Cuillère, No. 13, a patent of invention for 10 years, for *an improved Eau de Cologne, called "Universal Water,"* June 22, 1840.

De Beaucourt, A., of Habay-la-Neuve (Luxembourg), a patent of invention for 5 years, for *a machine for cutting velvet more expeditiously than can be done by any known process*, June 22, 1840.

Janmart, Louis, of Louvain, a patent of invention for 10 years, for *an improved piano*, June 22, 1840.

Lesoinne, N. M., and Pirlot, son, of Liege, rue de l'Université, a patent of importation for 5 years, for *a new musket called "à amorçoir,"* June 22, 1840.

La Société de St. Laurent, represented at Brussels by A. Deby, rue de la Putterie, No. 59, a patent of invention for 15 years, for *a new furnace for blowing window glass, with moveable stone*, June 22, 1840.

G. D. Poelman, of Ghent, represented at Brussels by Dixon, Hotel de Gronendael, a patent of invention for 15 years, for *a loom for weaving plain and crossed stuffs, plain and figured drills, fustian, satin, tick, &c., of yarn, cotton, wool, silk, and other fibrous substances*, June 25, 1840.

J. F. Hancq, of Braine-halleud, a patent of invention and improvement for 15 years, for *a pump in equilibrium for raising water with very little power in comparison with known pumps*, June 10, 1840.

Alfred White, of London, represented by Dixon, Hotel de Gronendael, a patent of importation for 5 years, for *improvements in the mode of saving persons by means of a floating insubmergible hat or cap*, June 29, 1840.

A Royal decree of the 29th June, approves the assignment made by John Beresford Attkins, of Mancheater, to Jamea Slater, of Salford, of the patent of importation for 10 yeara, 12th January, for *improvements in the apparatus for bleaching linen and other tissues, and other fibrous substances.*

Aerts, J. G., of Tongres, a patent of invention for 15 years, for *a new astronomical regulator with compensating pendulum*, June 30, 1840.

J. Gautier, J. J. M. Incolle, T. C. Vermorcken, and N. Reisgen, of Brussels, rue d'Or, No. 18, a patent of invention for 10 years, for *percussion cigars*, June 30, 1840.

L. Jorez, son, of Brussels, Lonque rue Neuve, No. 126, a patent of invention for 10 years, for *machinery for manufacturing oil-cloth*, June 30, 1840.

François Tillière, of Brussels, rue des Longs Chariota, No. 19, a patent of importation for 5 years, for *a loom for manufacturing hosiery goods in general*, June 30, 1840.

Victor de Rochetin, represented by Doré, St. Josse-ten-Noode, chaussée de Louvain, No. 24, a patent of importation for 5 years, for *an improved apparatus for filtering water and other liquids*, June 30, 1840.

Thomas Richardson, of London, represented at Brussels by Dixon, Hotel de Gronendael, a patent

of invention for 10 years, for *a preparation of sulphate of lead, applicable to certain purposes for which carbonate of lead is used, and particularly to staining and varnishing delf ware*, July 6, 1840.

Hotton & Beaumont, of Laeken, Château de Droesbeek, a patent of invention and improvement for 15 years, for *a new system of percussion, applicable to every kind of fire-arms, and for a new waterproof unalterable priming cartridge*, July 6, 1840.

B. Roy, of Fevey, Switzerland, a patent of invention for 15 years, for *a new saw for sawing veneers*, July 6, 1840.

J. J. Collin, of Havrennes, represented at Brussels by Dethy, of St. John's Hospital, a patent of invention for 10 years, for *a machine for sculpturing marble*, July 6, 1840.

W. H. Ritchie, of London, represented at Brussels by Dixon, Hotel de Gronendael, a patent of importation for 5 years, for *improvements in preparing and compounding colors for painting, and in the manner of applying them*, July 6, 1840.

Charles Van Cutsem, of Brussels, Quai-aux-Semences, No. 13, a patent of invention for 15 years, for *a new process of manufacturing loaves of refined salt*, July 15, 1840.

Theodore Lemielle, Liege, rue St. Thomas, No. 284, a patent of invention for 15 years, for *a lamp for the purpose of lighting mines*, July 15, 1840.

Charles Jacquemet, of Lembeck under Hal, a patent of invention for 15 years, for *a process for preventing the explosion of steam-boilers*, July 15, 1840.

Theodore Scheidtweiler, of Brussels, rue du Nord, No. 46, a patent of improvement and addition for 15 years, to date from Oct. 14, 1839, for *improvements and additions to a portable machine with rotary motion for threshing corn*, July 15, 1840.

H. Truffaut, of Mons, rue de la Chaussée, No. 9, a patent of importation and addition for 10 years, for *various improvements in the construction of weaving looms, worked by steam or any other motive power, for which he obtained a patent*, Sept. 30, 1839, July 15, 1840.

Albert Foss, represented at Brussels by Ferhagen, sen., rue de Minimes, No. 7, a patent of invention for 15 years, for *a process of manufacturing soap, by which the price of this article will be considerably reduced*, July 17, 1840.

FOREIGN CORRESPONDENCE.

FRANCE.

AGRICULTURAL STATISTICS OF FRANCE.

A report has been recently made to the King of France of the state of agriculture throughout the kingdom, enumerating the total quantities of agricultural products, and the quantities produced in each department. It appears from this report, that the 43 departments situated to the east of the meridian of Paris, comprise upwards of 26 millions of hectares of land, and a population of upwards of 16 millions. It is divided into 177 arrondissements, and into 119,000 communes. The northern part contains nearly twice as many as the southern; its surface is less extensive, but its inhabitants are more numerous. The northern district comprises 12 millions of hectares of land, and 1,719,000 houses liable to be taxed, which pay altogether 38 millions and a half francs. The southern district contains 12 millions and a half of hectares, and 1,444,000 of taxable houses, which contribute 30 millions and a half. In the former of these districts, the average rate is 2f. 68c. per hectare liable to taxation; in the latter 2f. 04c. In the northern district, the average contribution of each house is 3f. 93c., and in the southern 4f. 06c. The two districts combined, which constitute rather less than half of the whole of the territory of France, contain 24 millions and a half of hectares of land liable to be taxed, and 1,700,000 not taxable; with 3,163,000 taxable houses, and about 46,000, which are exempt from taxation. These facts respecting the territory, the population, and the property liable to taxation, will enable us to appreciate more fully the following numerical data of the agricultural statistics of this part of France.

Of the 26 millions of hectares of land which it contains, 9,600,000, or more than one third, are cultivated. This proportion would be increased to one half if there be added to the lands actually under cultivation, the fallow ground and the different plantations, comprising orchards, nursery grounds, &c. But if the number be limited to those lands actually under culture, considering even ornamental gounds as common pasture fields, it amounts to only 8,863,000 hectares of cultivated land; that is, in the proportion of one to five. In the northern division, there are nearly 10 hectares of cultivated land to 25 of pasture; and in the south the proportion is only 10 to 34. The total quantity of land under cultivation is divided into three principal parts; that is to say,

Corn.....	6,538,198 hect. or, three quarters	
Vines.....	897,423.....	a tenth
Other products....	1,428,081.....	a sixth

It appears from the forgoing statement, that there is more than one hectare of land in cultivation for every two inhabitants. The choice and the diversity of the kinds of culture are determined not only by the climate and the soil, but by the wants, and still more by the habits of the people. In the north, for instance, wheat occupies a space almost double that which is appropriated to that kind of corn in the south; barley and oats are cultivated to an extent four times as great as in the southern provinces, but the quantity of rye and maize is less by one half. Garden-grounds, and lands appropriated for the growth of dry fodder, are twice as extensive in the north, and the culture of beet-root and mangel-worsel is five-fold; hemp is a third more, and flax occupies twenty-three times the space.

The climate of the south, indeed, is favorable to the growth of many products that cannot be raised in the northern district of the kingdom. Thus, we find that, in the former, mulberries occupy 41,000 hectares, olives 117,000, madder 15,000, &c. The climate of the south is also more favorable for the vine, consequently we find that twice the quantity of land is occupied there by its culture compared with the north.

The quantity of corn required each year for seed, has not yet been estimated very correctly; it is, however, much greater than is commonly supposed. The total quantity of seed of the different kinds of grain, amounts annually to between 14 and 15 millions of hectolitres (a hectolitre is equal to two gallons and two pints). The quantity of seed sown on each hectare does not vary much; it exceeds two hectolitres in the principal kinds of corn, in the north as well as in the south. The quantity is rather greater for barley, and still more is required of oats. Potatoes require more than six millions of hectolitres, which is at the rate of twelve and a half hectolitres per hectare. The total value of the plants for this crop, amounts annually to 13 millions of francs.

IMPORTANT APPLICATION OF ELECTRICITY.

At a recent meeting of the Academy of Sciences at Paris, the following description was given by M. Becquerel, of an interesting voltaic experiment performed by himself, which exhibits in a striking manner how the intensity of electrical power is accumulated by the current passing through wires twisted spirally. A platinum wire placed in communication with the two poles of a voltaic battery, becomes red hot in a portion of its length. If that be twisted round spirally, all the heat is then concentrated in the interior of the convolutions. If a very small crucible be placed within the folds of the wire, the greatest conceivable effects of fusion are produced, even the platinum itself may be melted. The eye can scarcely bear the intensity of the light; the assays of the ores of gold and silver, in quantities consisting of several decigrammes, are effected in two or three minutes, and the combustion of diamond is produced in a few seconds. If, in order to prevent external radiation, the spiral wire be placed in the flame of a spirit lamp, the intensity of the incandescence is increased. The spiral may be put under the bell-glass receiver of an air pump, into which any gas may be introduced, and the fusion by this means be effected in gases, in a manner more satisfactory than chemists have hitherto been able to accomplish.

M. Becquerel has also made a skilful application of the power of electricity in the investigation of the influence of masses in the phenomena depending on affinities (a question that occupied much of the attention of philosophers at the beginning of the present century), and in measuring the degree of those affinities in different circumstances. "In one combination consisting of two atoms," he observes, "the two atoms are united together by a force called affinity, the nature of which is unknown to us, and which varies in intensity according to the temperature, and to different other physical causes. But if we were enabled by means of some instrument of excessive delicacy to seize hold of each of the atoms, and to withdraw them by a contrary force from their reciprocal attractions, the force employed to effect this separation might be regarded as the measure of the attractive force. In default of this ideal apparatus, we possess in electricity a power capable of doing the same thing. It appears from numerous experiments, with the aid of electrical action, that when two salts united with the same acid are dissolved in water, we possess the means of determining with accuracy the strength of the affinity of the acid for each of the two bases, and of following step by step the variations in this degree of affinity, according to the change in that of the saline bases."

We noticed in a recent number, that M. Guerin, a Paris surgeon, had performed a curious operation on the arm of a Russian surgeon, M. Doubowisky, on the system newly introduced called tenotomy, in which the instrument is worked under the skin without making any external wound beyond a mere incision for the entrance of the instrument. In the case of M. Doubowisky, nineteen muscles and tendons of the arm and wrist were cut in this manner, for the purpose of restoring the use of the limb and hand which had become distorted, in consequence of a fall two years ago. It appears by recent accounts, that the patient has experienced no serious inconvenience from the operation; that he has since gone into company and entertained his friends as if nothing had happened; and he says he felt no pain after the first two hours. Whether the use of the arm will be restored, remains to be seen, but at present it appears to be in a fair way of recovery, and it is extraordinary that, after so many divisions of the muscles and tendons, there should be no inflammation. The estimation of the sub-cutaneous mode of operating, will greatly depend upon the final success of this case.

Some idea of the immense increase of the population of Paris, may be formed by the following account of the provisions consumed in that city, and by its commercial transactions. In 1839, the number of boats that arrived in Paris by the Seine and by the canal de l'Ourcq, amounted to 19,664, the total tonnage being 1,919,654, that is, as much as the tonnage of Havre, Nants, Bordeaux, and Marseilles united, and 600,000 tons more than in the most prosperous year of the restoration, and twice as much as in the most prosperous year of the empire.

NEW ZEALAND.

A letter from a passenger of the Cuba, dated "Kawia," New Zealand, Feb. 14, 1840, describes the work of settlement as proceeding vigorously at Port Nicholson. A house built for himself, 30 feet in length by 18 in breadth, and divided into five apartments, was to cost about £6. Provisions were comparatively abundant and cheap. Fresh pork may be quoted at 6d. a pound, and potatoes at £4 per ton. Labor is also abundant and cheap, and there is plenty of work.

Papers have been printed by order of the House of Commons, containing the reports of Captain Hobson, R.N., of his proceedings on arriving at New Zealand. The first of these is an address of congratulation on arrival, presented to his Excellency by the (forty-five) inhabitants of the township of Kororarika, expressing their gratification at his safe arrival, and declaring that the establishment of British laws and British authorities had long been the desire nearest to their hearts. The most interesting portion of these papers, however, is a letter addressed by the Lieutenant-Governor to Sir George Gipps, from the Bay of Islands, describing the proceedings at a meeting which he had called of the native chiefs of the confederation, and of the high chiefs who had not signed the declaration of independence, for the purpose of explaining to them the commands which he had received from her Majesty, and of laying before them the copy of a treaty which he had to propose for their consideration. A vast number of chiefs, with a multitude of followers, crowded in from every quarter, and assembled under spacious tents decorated with flags. His Excellency opened the meeting by explaining, in the fullest manner, the object of his mission, and the reasons that had induced her Majesty to appoint him. He then read the treaty, and dwelt on each article, offering a few remarks explanatory of such passages as they might be supposed not to understand. Mr. H. Williams, of the Church Missionary Society, interpreted and repeated in the native tongue, sentence by sentence, all that his Excellency addressed to them. When his Excellency had finished, he invited the chiefs to ask explanations on any point they did not comprehend. Twenty or thirty chiefs, in consequence, addressed the meeting, five or six of whom spoke with so much violence and effect, that his Excellency was apprehensive that they had fairly turned the tables on him: but at this crisis the Hokianga chiefs, "under Neni and Patawoni, made their appearance," and nothing, says Captain Hobson, "could have been more seasonable." His Excellency insinuates that underhand influence had been at work, and two chiefs, whom he names as being followers of the Catholic bishop, were the principal opposers. One of these orators, Revewah, said, "Send the man away. Do not sign the paper; if you do you will be reduced to the condition of slaves, and be obliged to break stones for the roads. Your lands will be taken from you, and your dignity as chiefs destroyed." In this dilemma, and when things appeared to be looking very black for his Excellency, at the first pause Neni came forward, and eclipsed all rivals. He spoke with so much "natural eloquence as surprised all the Europeans, and turned aside the temporary feeling that had been created by the arguments of the other orators." He pointed out to the New Zealanders how impossible it was for them to govern themselves, and concluded his harangue by strenuously advising the chiefs to place confidence in the promises of the British. He was followed by two other favorable chiefs; and, after an adjournment of one day, it having been announced that the chiefs had become impatient to sign the treaty, it was signed in due form by forty-six head chiefs, in presence of at least five hundred of inferior degree. By the first article of the treaty, the chiefs of the confederation of the united tribes of New Zealand, and the separate and independent chiefs, expressly cede the powers and rights of sovereignty to her Majesty, over their respective territories; and by the second, her Majesty confirms and guarantees them in the possession of their lands and estates, forests, fisheries, and other properties, so long as they wish to retain the same; but they yield, at the same time, to her Majesty the exclusive right of pre-emption over such lands as they may be disposed to alienate; and the third grants to the natives of New Zealand all the rights and privileges of British subjects.

RAILWAY INTELLIGENCE,

DOMESTIC AND FOREIGN.

Blackwall Railway.—The results of the working of the Blackwall Railway continue to be in every respect most satisfactory. There are now four intermediate stations open, and, although only one line of rail is at work, the average number of passengers is about 6,000 daily. The second line has just been opened, and trains start every quarter of an hour, thus giving about 100 trains daily. As soon as their arrangements are fully completed, the directors will be prepared to accommodate steam-boat passengers on a large scale. Hitherto they have not been able to comply to any extent with the offers held out to them.—*Railway Times.*

Singular Accident on the Blackwall Railway.—Between five and six o'clock on Thursday, 6th inst., the following accident occurred on the above railway:—A man, named Henry Tanner, in the employ of the company, was standing on that part of the line, about a mile and a half from the terminus, when, perceiving a train of carriages coming in each direction, he immediately jumped out of the way, and stood clear of the rails. On the trains passing each other, the gust of wind occasioned by the swift motion of the vehicles was so great, that Tanner was dashed with considerable force against one of the carriages, having a most narrow escape of falling under the wheels. The violence with which he struck the carriage, however, caused him to rebound against the wall. One of the guards picked up the man, who was found to be quite insensible, and, with the assistance of two of the railway police, he was immediately conveyed to the London Hospital, Mile-end-road, where, on examination, it was ascertained that he had received a severe concussion of the brain, and of so dangerous a nature as to leave no hopes of his recovery.

London and Birmingham Railway.—The half-yearly meeting took place on the 7th inst. Very little discussion was entered into, except about a grant of £1,000 towards building a church. The report recommended a dividend of £4 per £100 share for the half year, and an addition to the reserved fund. The report also contains much matter of interest. It appears from it, that an increase has taken place in the half-year's traffic of 17½ per cent. as compared with the corresponding period of last year. The directors seem at last to have learned the necessity of providing for the low class traffic, as they state that they have decided upon establishing trains of third class carriages at 14s. They also recommend the proposed Warwick and Leamington branch to the attention of the proprietors.

Fatal Accident on the London and Birmingham Railway.—A few days since, an accident occurred on the London and Birmingham Railway, by which William Cooper, a guard in the employ of the company, lost his life, and which is the sixth accident of a similar character within a very short space of time. The down train from Leighton to Birmingham had just started from the former place, at which time the unfortunate man Cooper, as was his duty, was making secure the luggage on the top of one of the carriages, when the strap he was pulling tight, snapped close to the buckle, and he was precipitated backward, his head coming with violence against the iron rail of the up line. He was picked up in a state of insensibility and conveyed to the house of a surgeon in Leighton, where he received every attention, but expired in three hours after.

London and Brighton Railway.—The last report of the directors of the London and Brighton Railway Company states, that the whole will be completed for £1,800,000, although they have the power to raise £600,000 more.

The Liverpool and Manchester Railway Company, at their last meeting, declared 10 per cent., the *maximum* dividend allowed by their act.

Great Western Railway.—The opening of the line from Steventon to Faringdon last week has given a considerable increase to the returns, upwards of £1,000 being the first day's proceeds. The comparative returns for the last week of the Great Western and London and Birmingham lines show that the receipts per mile on the Great Western were about £105 10s., while those of the London and Birmingham were £155. The line will be opened from hence to Bath in about three weeks. Everything progresses most satisfactorily in regard to the preparatory arrangements. Mr. Brunel is now on the spot, and is pushing the work forward with great rapidity, and the utmost activity prevails in every department. One locomotive is at present being tried on this part of the line; and in the course of next week we understand four other engines will be placed on the rail for the same purpose.—*Bristol paper.*

Grand Junction Railway.—The half-yearly meeting of the proprietors of the Grand Junction Railway was held at Liverpool, on Monday. From the report, it appears that the receipts for the half-year ending June 30, were for coaching, conveyance of carriages, horses, parcels, and mails, 165,060*l.* 5s.; conveyance of merchandise, 37,967*l.* 17s. 4d.; live stock, 4,450*l.* 11s. 2d.; making a total of 207,487*l.* 13s. 6d.; exhibiting a total increase of 18,524*l.* 17s. 6d., as compared with the receipt in the corresponding period of 1839. The directors observe, that the increased profit of the half-year's business arose, not only from an increased receipt as compared with the same period last year, but also from a diminution in the per centage of expenditure. In the item of locomotive power, the expense had been 30,615*l.* 17s. 9d., against 35,450*l.* 0s. 8d. in 1839. The total charges for the half-year, exclusive of interest on loans, had been 94,661*l.* 12s. 9d., or about 45½ per cent. on the amount received from traffic. The balance, as shown in the accounts, is 111,296*l.* 6s. 5d, and, although the directors think it desirable that only the usual amount of dividend (7 per cent., which would require 9,353*l.* 16s.) should now be declared, they recommend a bonus equal to 15s. per 100*l.* share should be divided from the remaining surplus of 11,942*l.* 10s. 5d., which would absorb 10,645*l.* 2s. 11d., leaving 1,297*l.* 9s. 5d. A resolution, embodying the recommendation of the directors, was passed unanimously.

Southampton Railway.—Another accident occurred on the 7th inst., as the early fast train was coming from Southampton to Winchester. In consequence of the heavy rain that fell during the morning, it was found the engine was unable to drag the whole train. The engineer took part off, leaving the remainder of the train on the line, when the next from Southampton ran against it with a dreadful crash. Several ladies and gentlemen were seriously hurt; and had not the two engineers jumped off, they must have both been killed.

Manchester and Leeds Railway.—A few days since, an experimental trip was made on the part of the unopened line of the railway, for the distance of sixteen miles, commencing at Hebden Bridge, and continuing to Bradley Wood, near Mirfield. The admirable arrangements of Messrs. Tredwell, and the other contractors on the line, caused the affair to come off with great eclat. At Brighouse the party, which, with frequent accessions, then num-

bered about 300, sat down to a spleudid cold collatiou, laid out on two very long tables, in the open air Mr. Carr, of Halifax, took the chair; and Mr. Wm. Sutcliffe, solicitor, acted as vice; both of whom discharged their respective duties with ability and satisfaction. After the repast, the toasts of the Queen, Prince Albert, Manchester and Leeds Railway Directors, George Stephenson, Esq., Mr. Scott, the resident engineer, &c., &c., were severally given and responded to most enthusiastically. The fine specimens of superior architecture and masonry exhibited in many of the tunnels, bridges, and crossings on the line travelled over, elicited great praise and admiration; and more especially the contracts completed by Mr. John Tredwell, were alike remarkable for their substantial workmanship and beautiful finish. The day was unusually bright, and we are happy to say that the occasion was celebrated with great hilarity, and concluded without accident. The general opening of the line is anticipated to take place in November.—*Manchester Guardian.*

Liverpool and Manchester Railway.—The seventeenth half-yearly meeting of the proprietors of this railway was held last week, in the Cotton Sale-room, Liverpool. Charles Lawrence, Esq., having taken the chair, the net proceeds for the half year, ending 30th June last, were stated to exceed considerably those for the correspondiug period of the previous year; the amount for the first six months of 1839 being £48,211, and for the half year just concluded £52 471. These larger proceeds were stated to have arisen more from reduced expenditure than increased receipts. In reference to the junctiou of the Liverpool and Manchester with the Manchester and Leeds Railway, the directors trusted it would not be considered that they had lost sight of so important a subject; at the present moment, however, they were not prepared to recomend any definite course of proceeding to the proprietors. Among the various railways which have been opened to the public within the last six weeks, the Lancaster and Preston and the Preston and Wyre are the two most directly in communication with the Liverpool and Manchester. From the increased travelling which has ever followed the additional facilities afforded by new railways, the directors trusted that the two aboved-named undertakings will prove auxiliaries to the Liverpool and Manchester line. The accounts exhibited £126,474 9s 8d. as the total receipts for the half year, and £67,003 5s. 1d. as the total expenditure, leaving a balance of profit of £59,471 4s. 7d. To this was added the surplus of £10,784 18s. 3d. from the last half year's account, making a total of £70,256 2s. 10d. The number of shares entitled to a dividend, are—the old shares as heretofore, 7,968¾ £100 shares. New shares sold under the act, 136½ £100 shares: 7,968 £50 shares, equalling 3,884 £100 shares; making 12,089¼ £100 shares. The directors recommended a dividend of £5 per share, amounting to £60,446 5s., leaving a balauce of £9,808 17s. 10d. to be carried to the credit of the next half-year's account. The report was unauimously adopted, aud the dividend, recommended by the directors, ordered to be paid.

Railway Communication between Leeds and Bradford.—We are authorised to state, that a professional gentleman from London, acting under the sanction of some interested and influential parties, has been, during the last two months, employed in examining all the possible routes (including those heretofore projected) between this town and Bradford, with a view of determining the best and most economical line, before submitting it for public approval. Two lines have been surveyed, &c., and reported, but of course it would be premature to speak of their comparative merits further thau observiug that they both present favorable gradients, enter the Bradford end with a terminus, and that much care is now being taken to avoid heavy expense. We are, however, enabled to say that the above is but the first part of a more enlarged prospect; it being intended to continue the line, if at all practicable, from Bradford, by Halifax, to the Manchester line. Some progress has already been made on this work, with equal care and perseverance. In connection also with these two measures, should the Bradford or Bradford and Halifax lines succeed, it is proposed to examiue a line in anoth r direction, which will open up an entirely new route.—*Leeds Intelligencer.*

Eastern Counties Railway.—We would call the attention of the directors of this railway to a deficiency in the arraugements, which, if allowed to continue, is likely to lead the public into many annoyances. It is the want of the name of the locality conspicuously painted at each station. On Sunday last, a gentleman and three ladies had to go by the traiu to Ilford; being unacquainted with the line, they continued their journey uutil their arrival at Romford, when, to their great mortification, they fouud they had passed their intended destination by some miles. When a few shillings expended in paint would prevent these annoyances, it is to be regretted that such an oversight is allowed to continue.

Great North of England Railway.—There is every probability that this line will be opened to Darlington by the 1st of November. We are glad to hear that the financial state of this company is, both as to present and future prospects, much better than it was. The shareholders are beginning to see, and to appreciate the value of the property. Since the opening of the North Midland to Leeds, we understand three extra coaches through Darlington are not sufficient to take the passengers.

Preston and Wyre Railway.—Parties from the north, speak of the traffic of this line as surpassing all expectations in so short a time.

Fiendish Attempt to destroy Life on the Birmingham and Gloucester Railway.—On Wednesday evening last, a most diabolical attempt at mischief was made on the Birmingham and Gloucester Railway, by placing a railway bar and a large piece of timber across the rails, about a mile and a half below the Bromsgrove station, just as it was becoming dusk, and about a quarter of an hour before the last train became due. Happily the attempt was discovered by Mr. Unsworthy, a contractor, who, on passing along the railway, met a person of the name of Williams, with whom he had some conversation. Williams told him that there was a bar and a piece of timber across the rails further on, which, if the train came up, might be the death of twenty or thirty people. Mr. Unsworthy then walked on, and at the distance of about a hundred yards, he found the iron bar, and a hundred and twenty yards still further, the piece of timber, both of which he removed, aud was pressing forward to see that there was no other obstruction, when he fell in with a young man who had seen the before-mentioned Williams place the materials on the rails. Information was of course given to the officers at the Bromsgrove station, and Williams was consequently arrested, and on Friday taken before the magistrates at Droitwich. The evidence was so clear, that he was at once convicted, and the full fine of £10 inflicted, with costs. The magistrates expressed considerable regret that there was no law under which they could punish the prisoner more severely for so heinous an offeuce.—*Aris's Birmingham Gazette.*

Dreadful Accident on the Hull and Selby Railway.—Five Persons Killed.—An accident, the most extensively fatal to human life, we believe, that has occurred on any railway in England, took place on Friday, the 7th inst., on the Hull and Selby Railway, near Howden, as the train from Selby was on its way to Hull. As soou as the passengers who had escaped could recover from the shock, a dreadful spectacle presented itself. Under one carriage were found two passengers quite dead; and in the inside of the carriage, a respectable female also dead. Two other gentlemen were so dreadfully injured, that on being conveyed to Howden, they died in a few hours. Thus five lives have been lost. Other passengers received serious injuries. The strength of the iron table, and the force with which it must have borne against the wagon, are indicated by the fact that the table cut clean through four or five of the thick wooden transverse sleepers on which the rails are fixed; whilst the velocity of the train is proved by the fact that the mass of iron was pitched to a distance of 40 feet from the place where it forced tho carriage off the rails. The engine and tender was not thrown off the rails.

This most lamentable catastrophe, is a fearful lesson to the managers of railways to fasten all goods firmly upon the carriages, as the want of this secure fastening has been the sole cause of the present disaster.

On the subject of this accident, a letter, of which the following is a copy, appeared in the *Times* of Tuesday:—*To the Editor of the Times,*—Sir, As one of those who escaped unhurt from the terrible catastrophe upon the Hull and Selby Railway, on Friday morning, I have no material addition to make, or correction to offer, as to the facts stated by your Leeds correspondent.

I hope that the directors of the railway in question, and the directors of all other railways, will take warning, and make the best provision they can against such fearful occurrences.

Their own interests are at stake, and if you would touch the heart of a capitalist, you must (generally speaking) touch his pocket.

Where was the guard of the train when the catastrophe occurred? In his seat at the end of the train, where, observing the circumstances, he might have applied the check to the speed of the carriages, perchance prevented one half of the damage? No such thing. He was in one of the carriages which was upset, collecting the tickets of the Howden passengers preparatory to dropping them at that station, and was fain to save himself by leaping out. Who can excuse his being off his appointed seat, when the train was going at full speed? From my seat, which was in the middle of the train, I observed the progress of the accident, and I assert that there was a calculable interval between each two of the five successive shocks by which the five carriages were overthrown and destroyed; and I am quite confident that two, if not three of them, might have been preserved had the guard been in his proper seat, with a proper checking apparatus in his hands. At all events, the circumstances show the propriety of having a powerful check in the rear of the train. The carriage in which I sat, struck against that which immediately preceded it, but while this was shattered to pieces, that remained upright, merely stopping. Let any mechanic of science calculate what checking power would have saved the former.

Again—how, think you, were the luggage-wagons made? One was immediately behind me, aud therefore I can tell you. Why, you will say, of course they were walled up with wood, so that nothing could fall out without surmounting the top. Not at all: they consisted of parallel horizontal rails, with intervals of several inches, through which bodies quite large enough to cause terrible consequences might at any time escape. Let it not be said that I speak under the influence of fright. I marked the peculiar make of these things before the catastrophe, and had resolved to represent the danger.

But men will learn nothing without experience. When it became necessary to lift the fallen carriages, and replace them on the rails, not a single iron crowbar was at hand, and one only could be procured from the neighborhood. In a railway train, where a ton makes no difference, everything which may possibly be wanted, ought, I conceive, to be always in readiness.

I beg leave to ask contriving men, whether some plan may not be iuvented whereby not only the sides, but the euds also, of railway carriages running in train, may be furnished with the means of throwing off beyond the parallel on which they run, any body which the vibration may dislodge from their interiors? We are apt to think possible whatever is desirable; but I venture to hope that this

security will not be found beyond the reach of mechanical ingenuity; and I am sure that, if it be practicable, the insertion of the suggestion in your journal will insure it.

I am, Sir, yours obediently,
J. M. HARE.

18, Richmond-terrace, Dalston, Aug. 10.

GLASGOW AND PAISLEY RAILWAY.—The traffic on the Glasgow and Paisley Joint Railway is still producing the same flattering results we have before noticed. The passengers carried last week, amounted to 12,201, being a greater number than the preceding one. The total passengers from the commencement (17 days) is 34,676, and the proceeds £1,240 15s. 7½d. This is very nearly double the traffic calculated on in Parliament, and is a gratifying earnest of what may be expected from the whole line.—*Greenock Advertiser.*

ARDROSSAN RAILWAY.—We understand the railway between Kilwinning and Ardrossan is nearly completed, and will be opened in a few days hence. There has been for a considerable time a railway there, but it was only a single line, and the rails of a light kind, fitted only for a horse draught. The line is now double, it is laid with strong rails, and instead of passing at a distance from Kilwinning, and running on to Eglinton policies, it takes a curve northward, and joins the Glasgow and Ayr line at Kilwinning station. The trains that run on the Ayr railway are not the same as will run on the Ardrossan branch, but the times of starting from Kilwinning to Saltcoats and Ardrossan will doubtless be so regulated as to suit the passengers on the Ayr line; and in this way passengers from Glasgow will reach the fashionable watering-place of Ardrossan in two hours. A fine new engine, made by Messrs. Barr and M'Nab, for the Ardrossan branch, is to be sent off from Paisley on Monday morning, and a second one will follow in two or three weeks after.—*Paisley Advertiser.*

RAILWAY STATISTICS.—According to a return which has just been printed by order of the House of Commons, the number of Railway Bills brought into Parliament since 1830 is 201. Of this number, the bills for new railways amount to 74. The remainder (127) were bills to amend former acts, and to authorise an increase or decrease of the amount of capital originally provided for. The gross sum appears to be £63,226,931; but the capitals of two of the companies, the York and North Midland, and the Dublin and Drogheda, being reduced, the former from £370,000 to £335,000, and the latter from £800,000 to £600,000, we have to deduct from that amount £235,000. The exact total will, therefore, be £62,991,931. The progress of these bills through Parliament has been as follows:—

1831— 9	Bills.	Capital authorised....	£1,799,875
1832— 8	„	„	567,685
1833—11	„	„	5,525,333
1834—14	„	„	2,421,953
1835—18	„	„	4,864,633
1836—34	„	„	23,589,665
1837—42	„	„	13,518,799
1838—18	„	„	2,096,198
1839—25	„	„	6,599,458
1840—22	„	„	2,243,332

Of the new bills, no fewer than 29 were brought into the House during the speculative year 1836. In the year following, only fifteen new lines were proposed, since which, with the exception of the Edinburgh and Glasgow, with a capital of £1,200,000, there have been none but the inconsiderable ones of Taw Vale (Devon), and West Durham. The bills appertaining to 1838, 1839, and 1840, were almost exclusively bills to amend former enactments, and enlarge the capitals originally authorised.

RAILWAY RETURNS.—London and Birmingham, week ending July 25th. For the conveyance of passengers, parcels, horses, carriages, and mails, 16,335*l.* 10s.; merchandise, 1,867*l.* 9s.; cattle, 227*l.*; total, 18,429*l.* 19s.—Grand Junction, for the week ending July 25th. Passengers, parcels, and mails, 8,158*l.* 3s. 6d.; merchandise and live stock, 1,552*l.* 0s. 6d.; total, 9,710*l.* 4s.—Birmingham and Derby, week ending July 25th. Passengers, 1,008*l.* 7s. 10d.; merchandise, 179*l.* 10s. 8d.; total, 1,187*l.* 18s. 6d.—Midland Counties, week ending July 25th. Passengers (10,271) 1,537*l.* 19s. 3d.; merchandise, &c., 163*l.* 18s. 1d; total, 1,708*l.* 17s. 4d. —North Midland, week ending July 25th. Passengers and parcels, 2,356*l.* 6s. 6½d.; merchandise, 98*l.* 0s. 5d.; total, 2,454*l.* 16s. 11½d.—Newcastle and Carlisle, week ending July 25th. Total traffic, 1,707*l.* 17s.—Hull and Selby, from July 20th to July 26th inclusive. Passengers (5,773) 647*l.* 1s. 9d.; parcels, &c., 31*l.* 2s. 2d.; total traffic, 678*l.* 3s. 11d. —Manchester and Leeds (open 13½ miles), week ending July 20th. Passengers, 737*l.* 8s.; goods, 306*l.* 3s. 8d.; total, 1,043*l.* 11s. 8d.—Manchester, Bolton, and Bury, week ending July 23d. Passengers and parcels, 388*l.* 12s. 6d.; goods and coals, 128*l.* 19s. 10½d.; total, 517*l.* 12s. 4½d.—Great Western, week ending July 26th. Amount received for passengers, 5,408*l.* 15s. 8d.; merchandise, 524*l.* 10s.; carriage of materials for the line, 7*l.* 12s. 5d.; mails and parcels 337*l.* 9s.; total, 6,278*l.* 7s. 1d.—London and Croydon, week ending July 30. Passengers (11,033); total receipts, 796*l.* 6s. 2½d.—London and Greenwich, week ending July 30. Number of passengers (32,090); total receipts, 999*l.* 15s. 10d.—Liverpool and Manchester, week ending July 24. Coaching department 3,783*l.* 7s. 3d.: goods and coal departments, 1,899*l.* 1s. 6d.; total receipts, 5,682*l.* 8s. 9d. —Loudon and South Western, week ending July 26. Passengers, 6,854*l.* 14s. 3d.; goods, 428*l.* 7s. 3d.; total, 7,283*l.* 1s. 6d.—Manchester and Birmingham (from Manchester to Stockport, six miles), week ending July 27. Passengers (12,768); total traffic, 363*l.* 8s. 6d.—Birmingham and Gloucester (length of line opened 31 miles), from July 18 to July 24, inclusive. Amount received for passengers, parcels, carriages, and horses, 969*l.* 15s. 10d.—*Railway Times.*

THE ATTORNEY GENERAL *v.* THE BIRMINGHAM AND DERBY JUNCTION RAILWAY COMPANY.

Mr. Wigram, Mr. Turner, and Mr. J. Parker moved in this case for an injunction to restrain the company from varying their charges for passengers, cattle, and goods, on a part of their line between Nether Whitacre and Hampton-in-Arden. They applied under 3 Vic. cap. 51, sec. 63, which directed the same fares to be levied without favor or partiality, on all persons passing along the same line, and under the same circumstances. The complaint was made on behalf of the public, and the grievance was, that if passengers took places from Derby to London, the fare charged was £1 9s., 2s. of which were accounted for to the Junction Railway, but that if the passengers stopped at Hampton-in-Arden, the junction company charged 8s. instead of 2s. for the passage along the same space. This, the learned gentleman said, was a violation of the act, against which the Court would protect the public.

The Lord Chancellor said, the jurisdiction of the Court was very expansive, but not sufficiently wide to embrace the present motion. The Attorney-General did not interpose to protect all passengers, but he complained that some were carried too cheaply. It was plain the 63d section had no reference to this case, but was intended to prevent those parties who had monopolised the road, from carrying the goods of one person, and refusing those of another. The experiment was not one likely to be repeated, but he must dismiss the motion with costs.

MORECOMBE BAY RAILWAY.—This scheme is still kept alive by a proposal to steam from Fleetwood to Pile of Foudal, and then proceed, by railway, to Whitehaven. This, we apprehend, is the best plan; and as there is no road on the coast, it is the one most likely to do good, and succeed. We understand most of the projects in these parts are in a very quiet state.

DANISH RAILWAY.—It is not generally known that a railway from Altona, two miles from Hamburg to Kiel, in the Duchy of Holstein, has been projected, and is about to be constructed under the auspices of the King of Denmark, with a view of effecting a communication between the North Sea and the Baltic. Mr. George Watson Buck, engineer-in-chief to the Manchester and Birmingham Railway Company, has been selected as the engineer to the undertaking.

MANHEIM AND HEIDELBERG RAILROAD.—We learn from Carlsruhe, that the Manheim and Heidelberg railroad is nearly finished, and will be opened to the public on the 30th instant.

THE LATE RAILWAY ACCIDENT AT SELBY.—We have elsewhere given an account of the appalling accident on the Hull and Selby Railway, and now add the verdict of the jury, given at the adjourned inquest. The Coroner, in charging the jury, said he did not think that they would be justified in returning a verdict of either wilful murder or manslaughter. He certainly thought that proper attention had not been paid by the Leeds and Selby Company, in seeing that the casting was properly fastened, and it was for them to consider what amount of deodand they would impose upon any of the parties.

The Jury retired, and at half-past three o'clock returned with a verdict of "*Accidental Death*," and laid a DEODAND of FIVE HUNDRED POUNDS upon the *Engine and the whole of the Carriages, being jointly the property of the Leeds and Selby, and Hull and Selby Railway Companies.*

We have been given to understand, that the melancholy occurrence has had such an effect upon Mrs. Veltmann, as to cause a premature accouchement.

GRATUITOUS COPIES

of our Journal have been forwarded to a number of Individuals interested in some Patent, or Invention, of which notice has been taken in our number of to-day.

TO CORRESPONDENTS.

We shall, at all times, be ready to ANSWER QUESTIONS *that may be put to us, relative to any of the subjects indicated in our title; and questions put during the current week, will be replied to either the same, or following week.*

"THE INVENTORS' ADVOCATE, *and* JOURNAL OF INDUSTRY," *may be forwarded,* postage-free, *to all the undermentioned places:—*

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Bremen	Halifax	St. Domingo
Buenos Ayres	Hamburgh	St. Kitts
Canada	Heligoland	St. Lucia
Caraccas	Honduras	St. Vincent's
Carthagena	Ionian Isles	Tobago
Cephalonia	Jamaica	Tortola
Columbia	Laguayra	Trinidad
Corfu	Malta	Zante
Cuxhaven		

ADVERTISEMENTS *should be sent in not later than* Thursday Evening.

"C. L."—*The invention is* not *new.*

"D. Byng."—*Had our intemperate correspondent wailed the proper time, he would have found all as he could wish. The specification alluded to, appears in our paper of to-day. We would hint to our correspondent, that urbanity and politeness are better arguments than threats and intimidation. The latter* never *prevail with us.*

"E. J."—*It must not exceed six months.*

"W. C."—*Your communication will be very acceptable.*

TO OUR SUBSCRIBERS.

TWO *numbers of the* "INVENTORS' ADVOCATE" *(Nos.* 48 *and* 49*) were published* July 4. *The former contains, in addition to the usual varied matter, the* TITLE PAGE *and* a COPIOUS INDEX *to the* SECOND VOLUME.

VOLUME II. *of the* "INVENTORS' ADVOCATE," *handsomely bound, is* NOW READY. *A* FEW COPIES *of the* FIRST VOLUME *still remain on hand.*

TO INVENTORS.

ALL PERSONS who may be desirous of TAKING OUT PATENTS, or of bringing VALUABLE INVENTIONS into USE, are requested to APPLY to the PROPRIETORS of "THE INVENTORS' ADVOCATE," (DELIANSON CLARK & CO.) at their "PATENT AGENCY OFFICE FOR ALL COUNTRIES," 39, CHANCERY LANE, where they may be consulted, daily, relative to the PATENT LAWS of GREAT BRITAIN, and ALL OTHER STATES.—(See ADVERTISEMENT on the last page of the present Number.)

THE

INVENTORS' ADVOCATE,

AND

JOURNAL OF INDUSTRY.

SATURDAY, AUGUST 15, 1840.

We have, from time to time, directed attention to the working of the railway system of England, for the purpose of showing that the public do not derive those advantages from this improved mode of conveyance which it is capable of affording. Our observations have been made in no hostile spirit to railway companies, who, we acknowledge, have a claim to ample remuneration for the capital expended in attempting to increase the facilities of communication. The principle we contend for is, that these undertakings, in which the interests of the nation, as well as the convenience of the community, are concerned, should be managed with a more extended view than the gain of the shareholders; and that, as the public advantage is made the groundwork on which the claims for monopoly rest, the public advantage should form a principal element in the consideration of the directors. We are glad to perceive that, during the recent discussions of the Railways Bill in Parliament, the same principle was repeatedly urged by many members of greatest influence in both Houses.

The privilege of forming a railway on any line, is a practical monopoly of the conveyance in that direction. It is, too, a monopoly of the worst character, for it appropriates the use of an invention to which the appropriators have no claim beyond that of first possession; whilst it is calculated to diminish the facilities of communication in numerous instances, for which it supplies no effectual substitute. The impolicy of having permitted the railway system to take such extended ramifications, without any control or direction from the Government, is now forcing itself on the minds of our legislators; and, after the mischief is done, they are attempting to find a remedy.

We have previously animadverted on the Report of the committee on railway communication; we have since read the minutes of evidence on which the Report was founded, and, with such materials as are there presented, we are more than ever surprised at the one-sided, and extremely limited view taken by the committee. We apprehend it has happened in this case, as it generally does in the deliberations of small bodies of men, that the active exertions of one or two interested individuals have been the means of guiding the decisions of the well-meaning, but too compliant majority. A great part of the evidence taken before the committee, refers to the conveyance of goods by railway on the two principal lines, the London and Birmingham and the Grand Junction railways, to which subject the committee make no allusion in their report. It appears from the evidence, that the carriers and the public have just cause to complain of the want of proper accommodation for the transmission of goods, and also of the prices charged.

One of the great advantages which it was supposed would attend the formation of railways, was increased rapidity, and the diminished cost of the transport of all kinds of merchandise. That this expectation has been disappointed as regards the speed of transit, will appear from the circumstance, that the time now occupied from the loading of the wagons at the Camden Town station, to the delivery of the goods at Birmingham, is much greater than that which Messrs. Pickfords' vans formerly took to complete the distance. So little attention is paid to the accommodation of the public in this respect, that though the time actually employed on the journey is but eight hours, there is a delay at both ends, which protracts the time, from loading to delivery, to thirty hours. A good idea may be formed of the want of attention to general accommodation in the conveyance of merchandise, from the fact, that goods intended for Coventry are obliged to be taken direct to Birmingham, to be thence carted back to Coventry, a distance of eighteen miles, at an additional cost of 10s. per ton.

As regards the cost of conveying goods by railway, the balance is much in favor of canals. The price charged to the carriers to Birmingham, for general goods, is 18s. 8d. per ton for the use of the rails, and 12s. per ton for locomotive power. The latter charge, however, is for the trip to Birmingham and back. The charge is made on no amount less than 50 cwt., therefore if a quantity less than that be sent, the proportion per ton becomes much higher. The total charge per ton for general goods to Birmingham averages about 27s., not including the cartage to the railway, nor the delivery from the Birmingham station. The highest charge for canal dues to Birmingham is 14s. 6¾d. per ton, or not half the sum charged by the railway to the carriers. The cost of loading and carting to the canal, however, adds greatly to the expense of that means of conveyance, but as those charges have no reference to the railway expenses, the difference between the charges for using the two modes of conveyance, will still bear the same proportion.

The witnesses connected with the Birmingham railway, said they could not state positively what was the actual cost of carrying goods, nor would it be possible to obtain an accurate statement of it for some time to come, as the wear and tear of the rails, and the repairs of the road, could not yet be estimated. They were agreed that, let the cost be what it might, the present charge was too low, and did not remunerate the company. So far, however, as the actual cost of locomotive power is concerned, a tolerably correct notion may be formed, from the terms of a contract entered into with the London and Birmingham company, by Mr. Edward Bury, the present superintendant of the locomotive power on that railway. He engaged to carry passengers for a farthing per head per mile, and goods for a halfpenny per ton per mile, the company to find the engines, and he to keep them in repair. We may presume that a gentleman so experienced as Mr. Bury would not enter into an engagement of this kind to sustain a loss; therefore we may safely take the cost to the company, for locomotive power, at not more than the amount stated.

At this rate, the cost of actual transit from London to Birmingham is only 2s. 4d. for each passenger, and 4s. 8d. per ton of goods. It remains for the company to show, how it

happens that the charge of 12s. per ton for locomotive power, both ways, in addition to 18s. 8d. for the use of the rails down, and 22s. 6d. up, is not sufficient to afford a remunerating profit. It is a curious fact connected with the railways in the north and the south of England, that whilst the former derive the greatest amount of profit from the transport of goods, the profits of the latter are derived almost entirely from passengers.

One circumstance which shows most convincingly the defective state of the present accommodation for the conveyance of goods by railway is, that the quantity sent by that means has not increased; nor has the facility of railway conveyance much increased the general internal traffic of the country. It was stated by some witnesses, that, at a distance of 80 or 90 miles, common carriers can compete successfully with railways, owing to the delays that occur in the loading and delivery by the latter. The promised advantages of obtaining supplies of fresh meat, and other perishable products, from distant parts of the country, have indeed been almost entirely disappointed, in consequence of the great inattention to the convenience of the public in railway management.

It is true that the public have obtained an advantage, to a limited extent, by the reduction of the cost of carriage by canal, and the quickness and cheapness of the carriage of heavy goods by railway for long distances, as compared with the common wagon. But this is not the extent to which the advantages ought to reach. A great and important improvement has been made, by the application of mechanical science, in the means of facilitating communication, and the people ought not to be deprived of the full benefits which it is capable of affording, because it has been monopolised by certain companies for their individual gain.

IS GUNPOWDER AVAILABLE AS A MOVING POWER?

Is the use of gunpowder to be always confined to purposes of destruction, or can its terrific power be controlled, and rendered subservient to the arts of peace, as well as to the art of war? The prodigious force that is suddenly called into action by the explosion of gunpowder, appears to defy control, and to set the restraining power of man at defiance; but in proportion to the magnitude of the force, would be the advantage gained, if its application were practicable. It is well worth while, therefore, to consider the amount of the power thus generated, and whether there would be any advantage arising from its use were the means contrived of controlling and rendering it practically useful.

The cause of the explosive force of gunpowder is ascribed to the sudden generation of a quantity of gas by the combustion of the sulphur, the nitre, and the charcoal of which it is composed. The gas thus produced has been measured by experiments performed with tolerable accuracy, and it is found that the explosion of one ounce of the best gunpowder will generate about 460 cubic inches of permanently elastic gas. As one ounce of gunpowder occupies rather more than two cubic inches, the ratio of the respective quantities of powder and of the gas produced by its explosion, are as 1 to 244; that is to say, the explosion of one cubic inch of gunpowder produces 244 cubic inches of gas. The sudden generation of 244 cubic inches of gas, if confined within the space of the original bulk of the powder, would exert a force equal to 244 times the pressure of the atmosphere. In addition to this force, however, must be added the force acquired by the expansion produced by the heat of combustion. This has been estimated to increase the acting power of the powder, at the moment of explosion, in the ratio of 194 to 796; therefore, the total quantity of pressure exerted is equal to 1000 times the pressure of the atmosphere; assuming that the elasticity of the gases produced, increases in proportion to the degree of compression. By these calculations, it has been ascertained that the force exerted on a square inch, at the moment of explosion, amounts to upwards of six tons.

From this view of the explosive action of gunpowder, it appears that the force exerted at the moment of explosion arises solely from the sudden generation of a quantity of permanently elastic gas, occupying 244 times the space of the powder exploded, and from the expansion of that gas, into a space still considerably greater, by the heat of the combustion. The quantity of gas generated, has been tested by actual experiment; the effect of heat on its expansion in firing, is only the subject of calculation from analogy. It appears, however, from the results of a number of experiments made by Mr. Robius, on the velocities communicated to balls by different quantities of powder, that the theory corresponds with practice.

Assuming, then, these numbers to be nearly correct, we are furnished with data by which the extent of the power to be gained by the explosive force of gunpowder may be estimated, in its application as a mover of machinery. For instance, if half an ounce of gunpowder were exploded at the bottom of a cylinder, in which there was a closely-fitting moveable piston, the instantaneous effect would be to exert a pressure of 1,000 atmospheres, or 15,000 lbs., on the surface of the piston. Supposing that surface to contain 100 square inches, the pressure on each inch would be 150 lbs. This force would be rapidly diminished as the piston was raised, and the gas became expanded, and when the piston was lifted ten inches, all the expansive force would be expended, because the gas would then have space to expand itself to its full extent, including the dilatation from heat, which is reckoned equal to three-fourths the quantity of the permanently elastic gas generated. The average power exerted in raising the piston of ten inches, could not, therefore, be reckoned at more than 1,500 lbs.

We thus perceive, that the utmost effort of the explosive force of half an ounce of gunpowder is to lift a weight of 1,500 lbs. to a height of ten inches. Now, as the value of a horse's power is estimated at 33,000 pounds raised one foot per minute, it would require the explosive force of 13 ounces of gunpowder a minute to equal the power of one horse. In this calculation, we have not taken into account the advantage that might be gained by employing the partial vacuum produced after each explosion, but the degree of expansion is also considerably overrated, for when fired in a large space, as we have supposed, the quantity of heat produced by the explosion of the powder would be greatly diminished, and the expansion of the gas would consequently be much less.

It will be seen from this calculation, that, even were an engine contrived for safely employing the expansive force of gunpowder, there would be no advantage gained by its use in working machinery, as the expense would far exceed that of the same amount of power to be obtained by other means. It may, indeed, appear strange that a quantity of powder which is capable of producing the most destructive effects, should not possess more power than is produced by the efforts of a horse working for one minute. The destructive force of gunpowder, however, depends upon the great concentration of its power, and when a quantity of power is required to be directed against a small surface, it presents advantages far greater than

can be obtained by other moving forces. Its peculiar mode of action may possibly be usefully employed for other purposes than at present, when rapid motion is required; but as a constant moving power, it would be far inferior to steam.

SCIENTIFIC MEMORANDA, AND NOTES ON ART.

Wood Sculpture.—A committee of the "*Societe d'Encouragement*" has reported in the most favorable terms of a new mode of wood sculpture, invented by M. Franz, and executed by M. Greitnacher. Wood carved by this method can be sold very cheap. The plan consists in pressing, with the aid of the lever, a metal mould heated to redness, against the wood, which should be previously well soaked in water. The carbonised surface should then be removed by proper instruments. Soft wood, as that of poplar, chestnut, &c., is best suited to this mode of printing on wood, as it may be called.—*Echo du Monde Savant.*

Animal Heat.—Dutrochet has found that the temperature of the frog in the open air is 1 deg. C lower than that of the surrounding atmosphere; but that when immersed in water, its temperature is .03 to .05 C. higher that the surrounding air. The temperature of the grey lizard was 0.18 deg. lower than that of the atmosphere. The temperature of the carp when plunged in water is the same as that of the liquid. The leech and snail are colder than the atmosphere.

Maximum Density of Water.—The temperature at which water assumes its greatest density has been fixed by Muncke at 39 deg. 05, by Stampfer at 38 deg. 82, by Hällstroem at 39 deg. 25; more lately Despretz has fixed this point at 39 deg. 20: the mean of all these numbers is 39 deg. 08, so that perhaps 39 deg., the number obtained by Crichton, may be taken as the true temperature, without any sensible error.

Nests of the Fifteen-spined Stickleback.—(Gasterosteus Spinachia).—These are described by Dr. Johnston, of Berwick, in the last number of the Transactions of the Berwickshire Naturalists' Society. They are to be found in spring and summer on several parts of the coast, in rocky and weedy pools between tide marks. They are about eight inches in length, and of an elliptical form, or pear-shaped, formed by matting together the branches of some common fucus, as the *fucus nodosus*, with various confervæ, ulvæ, the smaller floridеæ and corallines. These are all tied together in one confused compact mass, by means of a thread run through, and around, and amongst them, in every conceivable direction. The thread is of great length, as fine as ordinary silk, tough, and somewhat elastic, whitish, and formed of some albuminous secretion. The eggs are laid in the middle of the nest, in several irregular masses of about an inch in diameter, each consisting of many hundred ova, which are of the size of ordinary shot, and of a whitish or amber color, according to their degree of maturity. Masses of eggs in different stages of their evolutions are met with in the same nest. It is evident that the fish must first deposit its spawn amid the growing fucus, and afterwards gather its branches together round the eggs. According to Olivi, these nests are formed by the Gobies. But the Stickleback has been carefully watched on the coast of Berwickshire in the act of making the nest.

A Newly-Invented and Curious Clock, representing a railway with several trains of passengers and luggage, travelling and passing through tunnels, attracts considerable attention at Lister and Son's, Newcastle. The clock strikes the hour, and produces a tone resembling that of a cathedral bell.—*Gateshead Observer.*

VARIETIES.

Steam to the Mediterranean.—The first of the Royal Mail Contract Steamers, *The Oriental*, will sail this month from Liverpool to Alexandria, landing passengers and goods at Malta, in the Ionian Islands, and in Greece. We understand that a line of steamers will sail from Suez, in connexion with the Mediterranean line, touching at Aden in Arabia, at the Island of Ceylon, and at Madras, on the passage to Calcutta. The steamers of the Mediterranean will leave Liverpool once a month.—*Liverpool Times.*

Postage to India.—The intelligence which reached India by the April mail, that "The Treasury has cancelled an important privilege heretofore existing, of transmitting *periodicals* and *pamphlets* for India and elsewhere by the Mediterranean packets, at *reduced charges*, and now requires that such should *be paid for at letter rates of postage*,"—has produced very general dissatisfaction. The *Madras Spectator* very justly remarks—"To impose letter rates of postage upon the pamphlets and periodicals transmitted to India, evidently amounts to little less than a downright prohibition; it will cut off our supplies of the lighter literature of our country, so welcome to the Indian resident, and which has just been placed within our reach at a moderate interval, after issuing from the English press, while it will shut out from us that clear insight into the workings of public opinion at home, which can only be gathered from a perusal of the pamphlets of the day in which all parties are accustomed to put forth their views and arguments."

Are Eels Fish?—At a Court of Conservancy held on Saturday on the river, near Kew Bridge, before the Lord Mayor, an appeal from the decision of the Brentford Magistrates was heard, and the conviction confirmed. One of the principal points urged by the counsel in support of the appeal was that eels are not fish. He quoted the authority of Mr. Jesse, who, in his "Gleanings in Natural History," in speaking of eels, says—"The eel is evidently a link between the fish and the serpent, but, unlike the former, it lives out of the water." He also believed the French nation ate snakes as well as eels, but they called one the serpent of the hedge, and the other the serpent of the water. Sir Humphrey Davy and other naturalists had ascertained that eels arrive in the river, at a certain period of the year, at the rate of 18,000 per minute, and go on for three days and nights together. It was, therefore, futile to contend that there could ever be a dearth of eels in the river Thames. In further proof that eels were not fish, he would produce evidence that they would live on land a month, and that they go on shore at night to feed. Eels did *not* spawn, as fish did. Eels brought forth their young. Eels ought to be considered in the same light as gulls, worms, frogs, &c, all of which were found at the bottom of the water, but none of which were fish any more than eels, and not one of which it had ever been contended were fish.

Importance of a Good Hand writing.—A bad handwriting ought never to be forgiven; it is a shameful indolence; indeed, sending a badly-written letter to a fellow-creature is as impudent an act as I know of. Can there be anything more unpleasant than to open a letter which at once shows that it will require long decyphering? Besides, the effect of the letter is gone if we must spell it. Strange, we carefully avoid troubling other people with trifles, or to appear before them in dress which shows negligence or carelessness, and yet nothing is thought of giving the disagreeable trouble of reading a badly-written letter! In England, good breeding requires writing well and legibly; with us (Germans) it seems as if the contrary principle were acknowledged. Although many people may not have made a brilliant career by their fine hand writing, yet I know that more than a few have spoiled their's by a bad one. The most important petitions are frequently read with no favorable disposition, or entirely thrown aside, merely because they are written so badly.—*Niebuhr.*

Potatoes raised from Cuttings.—Mr. Cortselt, of Stapleton, near Bristol, has succeeded in raising this valuable root from cuttings. Mr. Cortselt says—"Reasoning upon the analogy of the potato to the dahlia, I was induced in the spring to try an experiment on cuttings, and have succeeded admirably, having from white apples and foxes seedlings (an early potato) produced a good crop of full sized potatoes, many of which weighed half a pound. The method was this—when the potatoes were about nine inches high, I cut off the tops about six inches long, planted them in a line about eight inches apart, with a flat dibble, pressing the earth carefully against them, gave them water, and afterwards hoed them as an ordinary crop. I produced in this way at the rate of 140lb. per rod,"—*Liverpool Standard.*

British Steamers on the Nile.—The Oriental Steam Company have purchased the iron steamer, Dahlia, which is on the point of starting from England to the Nile, under licence of the Pacha, to convey the East India mails and passengers through Egypt.

Great Explosion at Spithead against the Wreck of the Royal George.—By far the most magnificent exhibition which has yet been witnessed of the enormous force of gunpowder when exploded under water took place on the 6th inst., at Spithead. The charge, which consisted of 25 barrels, or 2,250lbs., was placed at the depth of 11 fathoms and a half, or about 70 feet under the surface, nearly over the original position of the fore-hatchway of the old ship. When Colonel Pasley's preparative trumpet sounded, all eyes were turned to the launch in which Lieut. Symonds stood with the ends of the connecting wires of the voltaic battery in his hands. Scarcely had the word been given to "Fire!" and the trumpet sounded, when the whole area was shaken as if by an earthquake, the surface became ruffled like the top of a glacier, and in the next instant, literally in less than two seconds, the water bulged up and rose to the height of about twenty feet, after which a sort of a second burst or bulge occurred, which projected the sea in huge masses high into the air. Such was the violence of this effort that the spray was thrown completely over the adjacent vessels in a drenching shower, accompanied by gusts of wind radiating from the centre. Various estimates were formed as to the height of the column or columns of water. Some went as far as 100 feet, and some as low as 50. The commotion in the water, and the ocean of mud, dead fish, and other symptoms of violence which spread far and near, gave every promise that the operation will answer the purpose which Colonel Pasley has in view.

Napoleon's Tomb.—The model of the tomb of Napoleon, now erecting by M. Marochetti, under the dome of the Invalides, is composed of a large base, surrounded by columns and bas-reliefs, supporting at the four corners as many statues, one holding the globe, another holding the sceptre, and a third the hand of justice, and the last the imperial crown. Upon this is another base, two-thirds the width, and one half the height of the first, also decorated with bas-reliefs, and having at each angle an eagle with expanded wings. This again is surmounted by a pedestal eight feet high, decorated with bas-reliefs, and bearing in the centre the word Napoleon, upon which is an equestrian statue of the Emperor, wearing the imperial mantle, and having the brows crowned with laurel. The left hand holds the bridle, while the right carries the sceptre of the empire, raised to the height of the head. The two bases and pedestal, which rise to the height of nearly 40 feet, are of wood, and the statues of carton. The equestrian statue is 15 feet high, the eagles six, and the other ornaments in proportion. The effect is exceedingly grand, and worthy of the subject; it is expected to occupy M. Marochetti three years.

Discovery of Coal on the Black Sea.—A coal mine is said to have been discovered at Pendcraclia, one of the finest ports in the Black Sea, belonging to the Sublime Porte. A Turkish steam-boat was sent to examine the locality, and bring specimens to Constantinople. It returned using the coal for the production of its steam.

Island of Formosa.—At the French Academy, M. S. Julien read some extracts from a Chinese work, which stated that in the island of Formosa there are two volcanoes towards the eastern part; a boiling spring from which an inflammable gas issues (the boiling appearance being probably produced by the evolution of the gas); a muddy river and springs; a mountain of sulphur; and a bridge of iron wire which crosses the river Khichoui-Khi (rapid river).

New and Cheap mode of making excellent Ink.—A cheap and excellent ink may be made by a cake of limner's Prussian blue, being rubbed in the ordinary way, with water; when it may be put into the inkstand. Such a cake as may be bought for sixpence, will last twelve months if the ink be used daily.

Martyrology of the Press.—We find in the interesting *Journal des Connaissance Necessaires*, edited by A. Chevallier, professor of chemistry, an account of the Martyrology of the Journalists of the French revolution of 1789; who have, like all forerunners in a new course, levelled and cleared the road to honor and fortune for the journalists of the revolution of 1830; in the same manner as the blood of the first Christian bishops has spread roses on the paths of their successors. All the Presidents of the National Convention, with one or two exceptions, were journalists. Out of sixty-three who had the honor of presiding in that assembly, sixteen were guillotined, three killed themselves to escape the scaffold, eight were transported, six imprisoned for life, four became mad, twenty-two were outlawed, and only two escaped safe and sound from the fatal chair of that terrible assembly.

The *Journal du Havre* of the 4th inst, says:—The inventor of atmospheric railways, after having laid down his railway in England, arrived here yesterday, provided with a patent for its application in France. We are told that, in order to avail himself of his privilege, he proposes to select a place in our neighborhood where he can construct a model of a railway of this description.

New Mode of Getting up Steam.—Lieutenant Janvier, of the French navy, is said to have discovered the means of getting up the steam of engines with such rapidity, that in ten minutes from the first lighting of the fire, and although the water in the boiler be quite cold, a vessel may be set in motion. This is, it is added, to be accomplished without any additional apparatus, and with very little expense.

Chinese Literature.—A great number of valuable Chinese manuscripts and books, together with a Chinese printing-press, and other curious objects from the Celestial empire, have just been brought to Stettin by a Prussian merchantman, for the Royal library of Berlin.

Accident to the Apollo Belvidere.—A letter dated Florence, July 27, in the *Quotidienne*, mentions an unfortunate accident which occurred in the National Gallery there. A portrait of Charles V. on horseback, by Vandyk, fell from the wall to which it was attached, struck down the celebrated statue of the Apollo Belvidere, and fractured the two arms, the left leg, and the right foot. A committee has been appointed to take the best means of repairing those injuries. —(There must be some error in this statement, as the Apollo Belvidere is in the Vatican at Rome.)

The Archimedes Screw principle, is in progress of adoption in the Lancaster canal boats.

Polytechnic Institution.—On Monday next, two most curious models of a railway, upon an "entirely new" construction and principle are to be exhibited. The line of rail is to be composed of nothing but wheels, close to each other, on the tops of which the carriages are to be placed, and rapid motion being communicated to the wheels, the carriages are to slide along their peripherics.

The Leeds Mail is to travel by railway instead of by the coach, as formerly, arriving one day sooner in London. —*Lincoln Mercury.*

Gigantic Timber.—In the churchyard of the village of Brockenhurst, near Lymington, in the county of Hants, is a yew tree, the height of which is eighty feet, having a diameter of six feet, and a circumference of eighteen feet and a half. In the same plot of ground, stands also a noble oak, which is five feet and a half in diameter, and nineteen feet in the girth. The size of the churchyard does not exceed half an acre. Two such extraordinary trees, in so small a space, may be considered a rare circumstance connected with vegetation.

Destruction of Machinery.—On Friday morning, a steam-engine of great power, at Mr. Hall's silk factory, at Coggleshall, was from some cause at present unexplained, deranged in its movements, when the beam crank and several of the pumps were broken, and damage was sustained, we are informed, to the amount of upwards of £1,000.—*Chelmsford Chronicle.*

The Penny-Post Stamps.—Mr. Edmund Parsons has discovered a preparation, by means of which the cross, or countermark, stamped upon the labels after they have once

passed through the Post Office, can be so perfectly removed that the stamp may be again used, and the same agent will obliterate the marks again and again without the least injuring the original appearance of the label. Specimens, with the recipe, have been submitted to the Stamp and Post Office authorities, and so complete is the process that the letters containing them were franked with stamps that had been used twice, and one three times, previously.—*Brighton Herald.* [The same discovery has been made at York, as we have already stated.]

"*Master Humphrey's Clock.*"—The first four monthly parts of this work have been sent us to review—an unthankful task, for it grieves us to say that we cannot offer one word in praise of the writer. The public are informed that Boz (Mr. Dickens) is the author; indeed, we observe his name affixed to the wrapper. We would fain hope, however, that there is some mistake about this; such miserable trash could only emanate, one would suppose, from the brain of a Bedlamite. The *plan* of the work is as undecided from beginning to end, as the *characters* introduced are childishly absurd. We have forced a laugh, it is true, at the monster "Quilp," at "the child," and at the "old man of the curiosity shop." Such individuals were never before seen, or heard of; they are lunatics from their cradle, and commit so many acts of insanity, day after day, that without them, all interest would be gone. The author seems to run a tilt at nature throughout, and positively goes out of his way to revel in the monstrous, the unnatural, and the absurd. The consequence is, that "*Master Humphrey's Clock*" may, in a literary point of view, be pronounced a complete abortion. The woodcuts—some of them at least—are fairly executed, so far as the engraver is concerned; but the subjects are so wild, extravagant, and disgusting, that they are complete caricatures. It seems a pity that so much money should have been expended on such worthless materiel.

Lectures on the History of Wood-Engraving.—Mr. Mason' who bas recently arrived in this country from America, where he carried on a very extensive business as a wood-engraver, has just given two lectures at the Mechanics' Institution on the subject of wood-engraving.—That on the *historical* branch of the art, delivered on Wednesday evening, was particularly interesting, and was listened to with great attention, by a very respectable company.

Carstairs' Pellucid and Anti-Corrosive Writing Fluid.—This is a particularly pleasant ink to write with. It flows easily from the pen, is not subject to thickness from sediment, and becomes jet black immediately after use. All persons who are in the habit of writing much, will find Mr. Carstairs' fluid a treasure.

REPORTS OF SCIENTIFIC MEETINGS

NUMISMATIC SOCIETY.

Anniversary, 16th July, 1840.

The Society held its anniversary meeting in the rooms of the Astronomical Society, at three o'clock. Edward Hawkins, F. R. S., F. S. A., Keeper of the Antiquities in the British Museum, President, in the Chair.

The Secretary, Mr. J. Y. Akerman, proceeded to read the report, congratulating the society on its steady increase of members, which now amount to 197, and on the flourishing state of the finances of the society, whose assets far exceed its present expenditure. He then proceeded to mention the obituary of the society, which numbered amongst its losses three gentlemen addicted to the study of Numismatics in this country. Among the other objects which the Council particularly recommended to the Society, was the incorporating the account of the proceedings of the Numismatic Society into the Numismatic Chronicle as long as it should be continued to be conducted by an officer of the society, and that the work should be styled "Numismatic Chronicle and Journal of the Numismatic Society." The council proposed that, for the future, the journal should be offered to members at 9s., instead of 12s. 6d. per annum, and afford all possible assistance to it in the way of paying for engravings, illustrating papers read before the society, &c.; *also the necessity that the Society were now under of having apartments of their own.* Mr. Akerman then observed that the list of officers proposed by the Council would be found to contain gentlemen distinguished for their Numismatic Science, and that it contained the old list, with the exception of J. Dodgley Cuff, Esq., of the Bank of England, for treasurer, vice Dr. Lee, resigned, and Samuel Birch, Esq., sen., Assistant in the Department of Antiquities, and Assistant Secretary for the Archæological Institute of Rome (English Section), vice Francis Hobler, Esq., resigned. The President then, from the chair, nominated Mr. Pfister and Mr. Smith scrutators, and the ballot commenced for the ensuing year.

The President then, by authority of the Council, moved that the anniversary be changed to June. Mr. Brandreth, seconded by Professor Wilson, moved that a vote of thanks be offered to Dr. Lee for his kindness in giving his time and attention to the society, as treasurer, which was unanimously carried.

The President, from the chair, moved that a vote of thanks be passed to the Astronomical Society, for the kind use of their rooms, which was also carried unanimously.

A short communication was read from Mr. Ainton, relative to a medal engraved in America, of the city of Illinois. On the obverse was represented preaching in the desert, and on the reverse the city as it now exists, with railroads, edifices, locomotives, &c. The execution of the model is very creditable to the state of art in America. This model, which is in bronze, is of about three inches diameter, and struck in very high relief. The thanks of the Society were voted to Mr. Cunton for his communication.

The list of officers proposed by the Council was returned as elected at 8 o'clock.

ZOOLOGICAL SOCIETY.

Aug. 7. B. Bond Cabbell, Esq. V.P., in the chair.

The report of the council announced the balance in hand at the last report 2,624*l.* 0s. 2d., and the receipts of the month 1,450*l.* 12s. 2d., making a total of 4,074*l.* 12s. 4d. There had been paid for the purchase of exchequer bills 1,016*l.*, and a further sum of 500*l.* invested in the three per cent. consols. There had been expended on the farm for rent 30*l.*, on the gardens 819*l.* 1s. 9d., on the museum 119*l.* 11s. 11d., and the general establishment 104*l.* 7s. 4d., making a total of 2,589*l.*, and leaving a present balance in hand of 1,485*l.* 11s. 6d. Several presents were announced to the library and museum, and the number of visitors to the latter in July was 664, and from whom 3*l.* was received. Amongst the donations to the museum, was a napu musk deer, a puma, an alligator, nine gulls, three proteusses, two godarts, and several minor contributions. The number of visitors during the last month was 24,216, from whom 896*l.* 15s. was received. Mr. Barber Beaumont brought forward a motion, of which he had given notice, for the sale of ices and other refreshments at the gardens on Sundays, which was lost by a large majority.

URANIAN SOCIETY.

(*Continuation of Mr. J. M. Cavalier's Paper.*)

The prineipal evidences in support of the assumption of Laplace are afforded by the observations made upon the nebulæ, zodiacal light, the rings of Saturn, and the consideration of the supposed resisting medium and planatory arrangement.

Respecting the evidence afforded by the nebulæ, it is so analogous and conclusive that we cannot doubt at all the possibility of a nebulous mass possessing an inherent property of activity for altering its condition. The zodiacal light produces appearances, which lead to the conclusion that that luminous phenomena is a portion of the primitive solar nebulosity. The rings of Saturn, which have ever proved an enigma to the astronomer, are by this theory well accounted for; it was thought, until very lately, that there were only two rings to this planet, but from recent observations it appears there are five; if this be established by successive observations, the fact will prove one of the grandest analogies yet brought to light—of which Laplace would doubtless have happily availed himself.

With regard to the *supposed* resisting medium, it may be used as evidence of the truth of the nebulous hypothesis; but *admitting* that this medium exists, there are some doubts respecting its physical nature; and the two opinions held respecting it being somewhat opposed, we cannot with any degree of reason be satisfied with the testimony it would seem to give.

The laws of planetary arrangement are in strict accordance with the nebulous theory—it is only in the law which governs the densities of the planets that we find any discordance; that discordance is apparent in the densities of Jupiter and Saturn, but as these planets differ from the rest in the number of their satellites; there is doubtless a cause existing in them to produce this deviation from the general order. Of the planet Uranus, we have not sufficient knowledge for taking it into consideration, but there is every probability that this planet conforms to the general law which harmonises the whole system.

The only part of Laplace's theory which appears purely assumptive, is that relating to the radiation of a vast heat—there is not sufficient proof to throw this in an equal scale of probability with the rest.

ROYAL SOCIETY.

ON THE STRENGTH OF PILLARS OF CAST IRON.

In a paper read before the Royal Society, May 14, 1840, by Eaton Hodgkinson, Esq., the following statement was given of his experimental researches on this subject. The author finds that in all long pillars of the same dimensions, the resistance to crushing by flexure is about three times greater when the ends of the pillars are flat than when they are rounded. A long uniform cast-iron pillar, with its ends firmly fixed, whether by means of discs or otherwise, has the same power to resist breaking as a pillar of the same diameter, and half the length, with the ends rounded, or turned so that the force would pass through the axis. The strength of a pillar with one end round and the other flat, is the arithmetical means between that of a pillar of the same dimensions with both ends round, and one with both ends flat. Some additional strength is given to a pillar by enlarging its diameter in the middle part.

The author next investigated the strength of long cast-iron pillars with relation to their diameter and length. He concludes that the index of the power of the diameter, to which the strength is proportional, is 3.736. He then proceeds to determine, by a comparison of experimental results, the inverse power of the length to which the strength of the pillar is proportional. The highest value of this power is 1.914, the lowest 1.537, the mean of all of the comparisons 1.7117. He thus deduces, first, approximate empirical formula for the breaking weight of solid pillars, and then proceeds to dednce methods of determining their strength.

Experiments on hollow pillars of cast iron are then described, and formulæ representing the strength of such pillars, are deduced from these experiments.

After giving some results still in progress for determining the power of cast-iron pillars to resist long-continued pressure, the author proceeds to determine for his experiments the strength of pillars of wrought iron and timber, as dependent on their dimensions. The conclusion for wrought iron is, that the strength varies inversely as the square of the pillar's length, and directly as the power 3.75 of its diameter, the latter being nearly identical with the result obtained for cast-iron; for timber, the strength varies nearly as the 4th power of the side of the square forming the section of the pillar. Experiments for determining the relation of the strength to the length in pillars of timber, were not instituted, as, from the great flexure of the material, it was considered that no very satisfactory conclusions on this point could be derived experimentally.

In conclusion, the author gives the relative strengths of long pillars of cast-iron, wrought iron, steel, and timber.—*Proceedings of the Royal Society.*

CENTRAL SOCIETY OF EDUCATION.

T. Wyse, M. P. in the chair.

At the last meeting, an account was given of the Method of Instruction pursued in the Boston (U. S.) Institution for the Blind, extracted from the official Reports of the Trustees for 1839 and 1840. The Institution contains sixty-five pupils. The children are employed in making mattrasses, cushions, mats, brushes, baskets, and purses. The general rule is, that each pupil shall devote a part of svery day to study, the subjects being reading, writing, arithmetic, geography, and grammar, a part to music, and part to manual labor. Some learn algebra and geometry, in which it is said that the blind greatly delight, and three have made considerable progress in Latin and Greek. A gymnasium, provided with a bowling alley, is frequented by every boy twice a dsy, and during the warm weather they bathe daily in ths sea, and many of them have learned to swim. Some interesting particulars are given of the extraordinary case of Laura Bridgman, who is deaf, dumb, and blind, and has scarcely any sense of smell. In a psychological point of view this case is so interesting that we are glad to hear that careful observations have been made, with a view to ascertain the order of developement and the peculisr character of her intellectual faculties. The result will probably be made public; in the meantime, we shall quote Dr. Howe's account of her intellectual progress.

Laura Bridgman is thirteen years old, and has been about two years in the establishment:—"Having mastered the manual alphabet of the deaf mutes, and learned to spell readily the names of everything within her reach, she was then taught words expressive of positive qualities, as hardness, softness; and she readily learned to express the quality, by connecting the adjective hard or soft with the substantive; though she generally followed what one would suppose to be the natural order in the succession of ideas, placing the substantive first. It was found too difficult, however, then to make her understand any general expression of quality, as hardness, softness, in the abstract. Indeed, this is a process of mind most difficult of performance to any, especially to deaf mutes. One of her earliest sentences after learning the adjectives was this—she had found the matron ill, and understood that her head pained her, so she said, '*Smith head sick—Laura sorry.*' Next she was put to the positive expression of relation to place, which she could understand. For instance, a ring was taken and placed *on* a box, then ths words were spelt to her, and she repeated them from imitation. Then tbe ring was placed *on* a hat, and a sign given her to spell, she spelt, *ring on box*—but being checked, and the right words given, she immediately began to exercise her judgment, and, as usual, seemed intently thinking. Then the same was repeated with a bag, a desk, and a great many other things, until at last she learned that she must name the thing *on* which tbe article was. Then the same article was put *into* the box, and the words ring *in* box given her; this puzzled her for many minutes, and she would make mistakes; for instance, after she had learned to say correctly whether the ring was *on* or *in* a box, a drawer, a hat, a bucket, &c., if she were asked where is house, or matron, she would say *in* box. Cross questioning, however, is seldom necessary to ascertain whether she really understands the force of the words she is learning, for when the true meaning dawns upon her mind the light spreads to her countenance. In this case the perception seemed instantaneous, and the natural sign by which she expressed it was peculiar and striking; she spelt o *n*, then laid one hand *on* the other; then she spelt *i n t* o, and enclosed one hand *within* the other. Some idea of the difficulty of teaching her common expressions, or the meaning of them, may be formed from the fact that a lesson of two hours upon the words *right* and *left* was deemed very profitable if she in that time really mastered the idea. No definite course of instruction can be marked out, for her inquisitiveness is so great, that she is very much disconcerted if any question which occurs to her is deferred until the lesson is over. It is deemed best to grstify her, if her inquiry hss any bearing on the lesson; and often she leads her teacher far away from the objects he commenced with. * * In her eagerness to advance her knowledge of words, and to communicate her idess, she coins words, and is always guided by analogy. Sometimes her process of *word-making* is very interesting; for instance, after some time spent in giving her an idea of the abstract meaning of *alone*, she seemed to obtain it, and understanding that being *by one's self* was to be alone, or *al-one*. She was told to go to her chamber, or school, or elsewhere, and return *alone*; she did so, but soon after wishing to go with one of the little girls, she strove to express her meaning thus, Laura go *al-two*. The same eagerness is manifested in her attempts to define for the purpose of classification: for instance, some one giving her the word bachelor, she came to her teacher for a definition; she was taught that men who had wives were *husbands*, those who had none *bachelors;* when asked if she understood, she said '*man no have wife, bachelor—Tenny bachelor,*' referring to an old friend of hers. Being told to define bachelor, she said '*bachelor, no have wife, and smoke pipe.*' Thus she considered the individual peculiarity of smoking in one person as a specific mark of the *species bachelor.* * * She easily acquired a knowledge and use of active verbs, especially those expressive of *tangible action*, as to walk, to run, to sew, to shake. At first, of course, no distinction could be made of mood and tense, she used the words in a general sense, and according to the order of her *sense of ideas;* thus, in asking some one to give her bread, she would first use the word expressive of the leading idea, and say '*Laura, bread, give.*' * * Having acquired the use of substantives, adjectives, verbs, prepositions, and conjunctions, it was deemed time to make the experiment of trying to teach her to *write*, and to show her that she might communicate her ideas to persons not in contact with her. It was amusing to witness the mute amazement with which she submitted to the process, the docility with which she imitated every motion, and the perseverance with which she moved her pencil over and over again in the same track, until she could form the letter. But when at last the idea dawned upon her, that by this mysterious process she could make other people understand what she thought, her joy was boundless. Never did a child apply more eagerly and joyfully to any task then she did to this, and in a few months she could make every letter distinctly, and separate words from each other. * * She has the same fondness for dress, for ribbons, and for finery as other girls of her age; and as a proof that it arises from the same amiable desire of pleasing others, it may be remarked, that, whenever she has a new bonnet or any new article of dress, she is particularly desirous to go to meeting, or to go out with it. If people do not notice it, she directs their attention by placing their hand upon it. Generally she indicates her preference for such visitors as are the best dressed. She is so much in company with blind persons that she thinks blindness common; and when first meeting a person she asks as if they are blind, or she feels their eyes. She evidently knows that the blind differ from seeing persons; for when she shows blind persons anything she always puts their fingers on it. * * She is familiar with the processes of addition and subtraction in small numbers. Subtracting one number from another puzzled her for a time, but by help of objects she accomplished it. She can count and conceive objects to about one hundred in number—to express an indefinitely great number, or more than she can count, she says, *hundred*. If she thought a friend was to be absent many years, she would say—will come hundred *Sundays*—meaning weeks. She is pretty accurate in measuring time, and seems to have an intuitive tendency to do it. Unaided by the changes of night and day, by the light, or the sound of any time-piece, she nevertheless divides time accurately. With the days of the week, and the week itself as a whole, she is perfectly familiar; for instance, if asked what day will it be in fifteen days more, she readily names the day of the week. The day she divides by the commencement and end of school, by the recesses, and by the arrival of meal-times. She goes to bed punctually at seven o'clock, and of her own accord. For some time after she came under our charge, she had some one to put her to bed every night; but soon it was thought best to send her alone, and that she might not wait for any one, she was left alone one evening, and she sat until quite late, a person watching her: and at last she seemed to form her resolution suddenly—she jumped up and groped her wsy up to bed. From that time to this, she hss never required to be told to go to bed; but at the arrival of the hour for retiring, she goes by herself. * * The sense of smell being destroyed, it seems a curious question whether the effect upon the organ of taste is general or particular,—that is, whether the taste is blunted generally, and for all things alike, or whether one kind of sapidity is more affected than another: to ascertain this, some experiments have been tried, but as yet not enough to enable one to state confidently the results in minute distinction. The general conclusions are these:—Acids seem to make vivid and distinct impression upon the taste; and she apparently distinguishes the different degrees of acidity, better than of sweetness or bitterness. She can distinguish between wine, cider, and vinegar, better than substances like manns, liquorice, and sugar. Of bitters she seems to have less perception, or indeed hardly any. * * With regsrd to the sense of touch, it is very acute—even for a blind person. It is shown remarkably in the readiness with which she distinguishes persons: there ars forty inmates in the female wing, with all of whom of course Laura is acquainted: whenever she is walking through the passageways, she perceives by the jar of the floor, or the agitation of the air, that some one is near her, and it is exceedingly difficult to pass her without being recognised. Her little arms are stretched out, and the instant she grasps a hand, a sleeve, or even part of the dress, she knows the person, and lets them pass on with some sign of recognition. The innate desire for knowledge, and the instinctive efforts which the human faculties make to exercise their functions, are shown most remarkably in Laura. Her tiny fingers are to her as eyes, and ears, and nose, and most deftly and incessantly does she keep them in motion: like the feelers of some insects which are continually agitated, and which touch every grain of sand in the path, so Laura's arms and hands are continually in play; and when she is walking with a person, she not only recognises everything she passes within touching distance, but by continually touching her companion's hands, she ascertains what he is doing. A person walking across a room while she had hold of his left arm, would find it hard to take a pencil out of his waistcoat pocket with his right hand, without her perceiving it. Her judgment of distances and of relations of place is very accurate: she will rise from her seat, go straight towards a door, put out her hand just at the right time, and grasp the handle with precision. * * At table, if told to be still, she sits and conducts herself with propriety; handles her cup, spoon, and fork, like other children; so that a stranger looking at her would take her for a very pretty child with a green ribbon over her eyes. But when at liberty to do as she chooses, she is continually feeling things, and ascertaining their size, shape, density, and use—asking their names and their purposes, going on with insatiable curiosity, step by step, towards knowledge. Thus does her active mind, though all silent and darkling within, commune by means of her one sense with things exterual, and gratify its innate craving for knowledge by close and ceaseless attention. Qualities and appearances, unappreciable or unheeded by others, are to her of great significance and value; and by means of these, her knowledge of external natuie and physical relations will in time become extensive."

THE THEATRES.

"See that the players be well used."—*Hamlet.*
"Nothing extenuate, nor aught set down in malice." *Othello.*

The Metropolitan theatres present so few novelties, that our Report will now, week by week, be necessarily curtailed, until the re-opening of the winter theatres.

Haymarket.—Mr. David Rees, of the Theatre Royal, Dublin, appeared for the first time before a London audience, on Monday. The parts chosen for his *debut*, were *Galochard*, in the *King's Gardener*, and *Crack*, in the *Turnpike Gate*. In both, he was highly successful. He is of portly bearing, halting a little with one leg; has a most ludicrous physiognomy, and a nice perception of comic humor; and only requires a week or two in London to make him a favorite. He sings with much breadth of effect, and carries his audience with him throughout. He reminded us, alternately, of Liston, and John Reeve; we should say, he is a great admirer of the former, from whose acting he seems to have taken his model. Macready, in the *Lady of Lyons*, and *As you Like it;* and Harrison and Miss Rainforth in *Love in a Village*, have been the principal attractions of the week.

Drury Lane.—The *Concerts d'Eté* will terminate this evening, to the sincere regret of a very numerous class of her Majesty's musical subjects. We cannot but congratulate Mr. Eliason on the spirited manner in which he has conducted the concerts throughout. He has, regardless of expense, engaged the very first available talent, English and Foreign; and the Promenade has been all that elegance and good taste could make it. We hear the speculation has been so profitable, that Mr. Eliason has become lessee of the theatre for the ensuing season, and that he purposes producing a succession of operas that will bring into play all the vast resources of his well-organised band. May success crown his undertaking!

English Opera.—A "novelty" has been produced here, entitled *Ernestine*, or *A Woman's Love*. We have so tender a regard for this establishment, that we shall pass over all notice of this novelty, and by so doing we shall deserve, and no doubt receive, the cordial thanks of all concerned in its concoction and representation. The other lively burlettas, so successfully brought forward within the last few weeks, continue as popular as ever.

New Strand.—*Mr. Weller's Watch*, a version of *Master Humphrey's Clock*, illustrating the loves of *Mr. Weller, sen.*, (only tolerably represented by Salter), and *Miss Benton*, the housekeeper, smartly embodied by a Mrs. Norton, whose age and figure were "the exact thing," has been produced here, and has been well received. Unlike its original, which is the most unfortunate "mistake" for its author that could have been perpetrated, it affords scope for some very funny bits of comic acting. *Daniel Quilp*, for instance, as represented by Attwood, would move the countenance even of a teetotaller, and infallibly cause him to laugh outright. His fiendish chuckle, conveyed in a fiendishly musical voice, was appalling to the last degree. A lady near us shuddered so visibly, and her nerves were so conspicuously acted upon, that we felt bound, in pity, to borrow of a fair friend who accompanied us, a *vinaigrette*. The application of this to the nasal organ of the excited lady, at last restored her to equanimity. Notwithstanding, however, the disgust inspired by the said *Daniel Quilp*, he is, in the hands of Attwood, made a person of very considerable consequence in the burletta; so much so, that without him, the piece could not get on. Owing to its success, the *watch* is announced to "*strike* regularly every evening for six months." By this time, we should say, it would be *wound up*. To the above has been added a burletta called *One Fault*. It possesses indeed but one fault, and that is—the fault of its having ever been written or acted.

Paris.—*Variétés.*—The piquant title of *La Femme de mon Mari*, drew a considerable crowd to witness its first representation on Tuesday. The plot turns upon the tribulations of a poor professor, who, having left his wife at Toulouse while he comes to Paris to solicit advancement, on his arrival renews his acquaintance with an ancient *amie*, who assumes his name and passes as his better-half. The arrival of the real wife soon afterwards takes places, and leads to a series of troubles, evasions, and mistakes, which keep the audience in excellent humor, though, as a whole, the piece can scarcely be pronounced worthy the pen of M. Rozier. It was very well acted by Prosper and Mdlle. Esther, and some sly hits at the race of journalists told extremely well with the public—the ungrateful public—who forget all they owe us.

Vaudeville.—The title of the last novelty at this house is, *M. Daube; ou, le Disputeur.* Thrice happy is the man whose path through life has not been crossed by one of the numerous family of the Daubes, the most inveterate disputants, with whom all agreement is impossible; who, if you hazard a difference with them in opinion, fly into a rage, and if you agree with them, find you dull, spiritless, and stupid. The character is a good topic for satire, but is an old stager, familiar to all playgoers from the time of Molière. The piece is, however, poor in the extreme, and, but for the excellent acting of Ferville, would not have been received with the favor which attended its performance.

Palais Royal.—Here we have Alcide Toussez, with his lumbering but not unamusing vulgarity, making love to a young lady in the disguise of a man of rank—the *Chevalier de Kersedac*. This worthy gives his title to the vaudeville, which contains nothing beyond Alcide's humor and costume that any spectator would care to remember. These, however, were quite sufficient to secure the indulgence of the public, who laughed heartily at the actor, but did not think it worth while to require the name of the author.

Gaité.—Le Château de Verneuil is the title of a kind of dramatic version of the assassination of the poor boy at La Villette, by the wretch Elizabide, but with a tremendous superstructure, in which all the abominations of the ancient melodrama are duly brought into operation. With these elements, it is scarcely necessary to observe that the piece is highly successful, which does not prevent its being a very complex and heavy affair.

The lovely Cerito is engaged for six nights at the Grand Opera, her present arrangements not permitting a longer stay in Paris. This theatre, which was announced to re-open on the 10th inst., will not be ready for the reception of the public at the earliest before the 20th. We have witnessed the progress of the workmen and artists engaged in the repairs and embellishments, which, though rapid in the extreme, can only be brought to a conclusion with unceasing labor by the latest day mentioned. So far as we can yet judge, the *salle* promises to be both convenient and elegant. *Stradella* will be one of the earliest revivals, with Marié in the principal character. *Le Diable Amoreux* will follow the opening in about ten days.

The *Théâtre Français* is nearly ready to open; the decorative portion of the alterations is in good taste, while a desirable extension of room in the orchestral stalls, and the elevation of the back seats in the balcon, will add largely to the comfort of the frequenters of those parts of the theatre. The first novelty is understood to be an historical drama on the conspiracy of *La Tréaumont*, written, we understand, for the Renaissance, but on the close of that ill-fated theatre, presented and accepted at the Français.

The charming opera of *La Neige*, retouched, and with additions, by its composer, Auber, for Mme. Anna Thillon, will be the next novelty at the Opera Comique. The engagement of this fascinating singer is among the best made by the manager, who founds high expectations upon her success. A new opera, by Monpou and Bordèze, is in rehearsal, called *Jeanne de Naples*, in which Botelli, Chollet, and Mme. Garcia, sustain the principal *roles*.

A scheme is on foot to open the *Odéon* with performers belonging to the other theatres of Paris, to vary the pieces every night. For instance, on one night the actors of the Français and Vaudeville are to appear; on the next, those of the Gymnase and the Porte St. Martin, thus rendering the Odéon a common ground for every style of performance. The design is yet merely in embryo; whether it will ever become more than a project, time will show.

Application has been made, it is said, to the authorities, to demolish the theatre of the Porte St. Martin; to improve the rue de Bondi, which runs at the back. In this case, the new spacious Bazaar on the Boulevart Bonne Nouvelle is spoken of as the new site of the theatre to be pulled down.

Frederick Lemaitre has been for the last fortnight attracting immense audiences to the Ambigu, in the clever, though absurd rhapsody of *Kean; ou, Genie et Disordre*, by Alexandre Dumas.

Mad. Dorus Gras is engaged for the Hereford and Birmingham festivals.

Mad. Sutton, an American vocalist, has arrived in Paris, on her way to New York, from Italy, where her talents have met with distinguished success. Mad. Sutton's voice is a soprano of excellent quality, and she not only received the warm approbation of the public in that land of song, but the most flattering testimonials from some of the greatest composers of the day, among whom it is only necessary to name the minstrel of Pesaro—the matchless Rossini.

BEETHOVEN.

Every lover of genius must lament to learn, not only that the most illustrious musician of modern times, even while the world was filled with his fame, spent his life in penury and personal neglect, but that his surviving relatives are at this moment in a state of poverty bordering on destitution;—and this, too, in a country considered as being, *par excellence*, the land of music!

When Beethoven died, in 1827, a *will* was found among his papers, made by him during a dangerous illness in the year 1802, and addressed to his brother Carl and his nephew Ludwig Beethoven. His brother died before him; and this will, which remained in the possession of his brother's widow, has now been sent to England for the purpose of being sold to relieve the urgent necessities of herself and her family. It is in the hands of Messrs. Cramer and Co., of Regent-street.

It was during Liszt's recent visit to London, that the will was sent to him by the widow of Beethoven's brother, accompanied by a letter (which we have seen) from that lady, describing in most affecting language the melancholy circumstances of herself and her daughter. "Had I not borne the name of Beethoven," she writes, "I should never have dared to trouble you with my request; though your character for generosity is acknowledged all over Europe, so much genius and talent having seldom been combined with such benevolence. My present unhappy condition is the cause of my troubling you with this letter, as I am in danger of being completely destitute if your assistance does not soon arrive, my creditors having consented to wait no longer than is requisite for me to receive an answer to this letter." "The more speedily," she adds, "the assistance comes, the more valuable it will be, for through it alone can we be saved from destitution; and the gratitude of myself and my child will be without bounds." If Beethoven himself, in his latter days, though still living in the midst of professed patrons, friends, and admirers, made an appeal to the generosity of the English public, it is the less surprising, though not the more

creditable to his countrymen, that such an appeal should now be made by his surviving relatives.

Beethoven's will, which is wholly in his own hand-writing, is a precious relic. Its contents are most deeply interesting and affecting. The following passages, which we extract from it, will enable the reader to form an estimate of this great man's real character, and to imagine what he might have been under happier circumstances:—

"My mind was formed, from my cradle, for the gentler feelings of our nature, while it seemed destined to achieve something great. To this I always found myself irresistibly impelled. But, when only six years of age, I was unhappily attacked by a disease, which was rendered still more afflicting by the mistakes of the physician under whose care I was placed. After lingering, year after year, in the hope of recovery, I was at last doomed to the unhappy prospect of an incurable evil. Though born with an ardent and lively disposition, and a mind alive to the pleasures of society, I was obliged to withdraw from them, and lead a life of solitude. Sometimes, indeed, I made an effort to participate in social enjoyment, but, alas, my efforts only made me doubly feel my incapacity. How could I be always saying, 'Speak louder, I am deaf!!' When I would willingly have mixed among you, my misfortune was felt with double keenness, from the conviction that I must forego the delights of social intercourse, the sweets of conversation, the overflowings of the heart. When I ventured to appear in society, I felt myself, as it were, an excommunicated being. If circumstances compelled me to appear in the presence of strangers, an indescribable agitation seized me—I was tortured by the fear of being conspicuous only by my infirmity. I was persuaded to go into the country, where I tried to join in the society of my neigbbors. But how bitter was my mortification, when some one near me would stand listening to the tones of a flute, which I could not hear, or to the shepherd's song, rising from the valley, not one note of which I could distinguish! Such things almost drove me to despair; nay, even raised in my mind gloomy thoughts of seeking relief in self-destruction. Thus have I continued to drag on a miserable existence—truly miserable, inasmuch as with so sensitive a bodily frame, any sudden change was capable of hurrying me into the most violent extremes. Yes, Patience, I must take thee for my guide, till it shall please the fates to cut the thread of my existence. Be it for better or for worse, I am prepared to meet the issue; though, for a man in his twenty-eighth year, it is no easy task to become a philosopher, and still more difficult for an artist than for any other man."

* * * * *

"I hereby declare yon the joint heirs of the little property, if so it can be called, which I have been able to lay up. Share it equally and justly; live in harmony together. and help each other. Whatever you have done against me, be assured that it has long since been forgiven. I thank you, in particular, my dear brother Carl, for the affectionate attentions I have of late received from you. I sincerely hope that your life may be more free from care and sorrows than mine has been. Teach your children to love Virtue; she alone, and not perishable gold, can make them happy. I speak it feelingly, and from experience: it was her hand that upheld me in the midst of the ills of life. To her influence, next to that of my art, do I owe the blessing of my not having terminated my existence by suicide. Live virtuously, and love one another."

PUBLIC COMPANIES.

THE NATIONAL BREWING ASSOCIATION.

Few persons can be ignorant of the great difficulty there is in procuring *genuine* beer; that is, the pure essence of malt and hops. To remedy this great evil in so large a population as London, is the laudable object of this association, whose capital is £200,000, in 20,000 shares of £10 each.

"In remitting the duty," say the Company in their prospectus, "upon fermented liquors to the extent it did, and in sanctioning the establishment of beer-houses, it was the intention of Government that the laboring classes should have every facility placed within their reach to enable them to supply themselves at a moderate rate with such a necessary portion of their comfort; but how badly the system has worked, both as regards health and morals, is too painfully evinced by the alarming increase of gin palaces, the preference to ardent spirits being generally attributed to the deleterious beer sold at most establishments, so that the humbler classes, instead of enjoying the pure unadulterated beverage contemplated by the legislature, have an unpalatable, and often injurious and pernicious article, from the want of ability to prepare their own. The repeated convictions of licensed victuallers and beer-shop keepers, in heavy fines by the Excise Commissioners, clearly prove the truth of the above statement.

"Had the duty been removed from malt instead of the manufactured article, matters would not have been greatly improved; the trouble, expense, want of convenience, utensils, knowledge of brewing, &c., would have operated to prevent the great mass of consumers from brewing; and it is to obviate these objections that "The National Brewing Association" has been formed, to enable every private family to make their own ale and porter from genuine malt and hops at one half the expense, and without trouble or loss of time."

The simple but efficient mode proposed by the Company to accomplish their object, deserves every encouragement; and we sincerely hope they will be able to effect a radical change in the present evil system of supplying the public with (so called) beer.

ADVERTISEMENTS.

COLLEGE for CIVIL ENGINEERS.—NOTICE IS HEREBY GIVEN, that the College has been removed from the temporary premises at Kentish Town to very spacious and airy freehold premises at Putney, the purchase of which has been effected by the Council; the Students reassembled on Thursday the 13th inst.

By order of the Council,
J. E. B. CURTIS, Secretary.

Every information as to terms, mode of admission, and the general regulations of the College, may be obtained by application to the Secretary, at the Office.

Office, 9, Villiers-street, Strand.
July 22, 1840.

WESTMINSTER DISCOUNT, LOAN, and INVESTMENT SOCIETY, established pursuant to Act of Parliament, No. 10, Buckingham-street, Strand.—Notice is hereby given, that applications for LOANS may be made daily, at the Offices of the Society, from nine in the morning until five in the afternoon, excepting Saturdays, on which day the offices will be closed at three precisely. The Directors, with a view of enabling the public generally to participate in the benefits of this Institution, grant debentures for deposits of not less than £5, bearing interest at the rate of five per cent. per annum, payable monthly, quarterly, or half-yearly, as may be required. LETTERS of CREDIT may be had upon all Towns in Europe, and the Continent of America.

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THE

INVENTORS' ADVOCATE,

AND JOURNAL OF INDUSTRY;

A WEEKLY BRITISH AND FOREIGN MISCELLANY OF

INVENTIONS, TRADE, MANUFACTURES, LITERATURE, AND THE ARTS.

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EXPLOSIONS IN COAL MINES.

In alluding to the recent accident at the Mostyn Colliery, the Editor of the *Liverpool Journal* makes the following very sensible observations:—

"The great frequency of accidents in collierics, and the dreadful mortality attending them, the amount of which far exceeds what would be supposed by those whose attention has not been specially directed to the subject, has often been remarked, and endeavored to be remedied, by philanthropists, whose efforts, however, have met with but little sympathy from the public,—principally, we fear, from a prevailing feeling that such calamitics are inseparable from the working of coal mines, and beyond human skill to avert. To a certain extent, they undoubtedly are, but that, by good management, their frequency may be very much diminished, no one acquainted with the subject, and who has observed the very different ratio of mortality in different mines, and under different systems of management, can for a moment doubt. In the year 1835, a committee of the House of Commons made a very elaborate investigation into the subject, and presented a very instructive report, and it is much to be regretted that no practical measure was founded on it, and that the report itself only exists in a form not generally accessible to the public.

"The great bulk of accidents in coal mines arise from the explosion of fire damp, or carburetted hydrogen, and their general nature may be very briefly stated. In all coal seams, this gas exists in a state of compression in the cavities of the coal, or of the "sill," or carboniferous clay slate, above or below, and it is liberated in the process of workiug. When it accumulates in the workings to a certain extent, it explodes on contact with flame, and scatters death and destruction round it. The meaus of preventing its accumulation are, perfect ventilatiou; that is, sweeping the workings by a current of air, circulated by the rarifaction effected by fires kept up at the foot of the pits. The means of preventing its explosion, are, by directing the foul air into the shaft above the fires, and by furnishiug the workmen with lamps protected by fino wire gauze, which by a curious law of nature the gas does not penetrate.

"Accidents occur, of course, from the non-fulfilment of these conditions. From the sudden liberation of an immense body of gas, which fills the pit faster than the ventilation can clear it; from the gas coming in coutact with flame, either by the use of open caudles, or by the miners unscrewing the gauze covers from the lamps to get more light; from the gauze covers becoming injured or foul; or, more commonly, from the ventilation being incomplete, when the ordinary discharge of gas accumulates until the flame expands within the glass, heating the gauze red hot, and on any particle of dust being driven against it, it inflames, and fires the atmosphere.

"The ventilatiou may become incomplete either from the supply of air being originally inadequate, or from neglect in the opening or shutting of one of the numerous doors or valves which, in extensive workings, direct its course. The latter is believed to be the most common case. Or a partial explosion may drive two air courses into one, and thus stop the ventilation of the whole mine; this is particularly apt to be the case when the "brattice" or partition, is slight, and of wood.

"In a general way, the deepest seams furnish the best coal, and are the most dangerous to work. The degree of danger varies much, both in particular seams and in particular stages of the process of working them. Some mines of coal contaiu so little inflammable gas, that they are worked without the least danger, with opeu candles; others so much, that they have been carefully walled in from the other workings in the same mine; and there is one at Whitehaveu that has furnished an uninterrupted stream of inflammable gas for seventy years, and burns to this day as clear and steady as it did in the middle of the last century, when Mr. Spedding proposed lighting the town with it. When a field of coal is first tapped, it usually furnishes gas much more profusely than it does afterwards, and a year or so may elapse before it is safe to work.

"It is a general impression, that Sir Humphry Davy's cclebrated invention has been the means of saving much human life. Nothing can be more fallacious. Both that and the less celebrated, but not less important, invention of Mr. Spedding—of sending up the foul air above the ventilating fire, not through it—have occasioned a prodigious mortality, though through no fault of the inventors. By means of them, seams are worked to the profit of the proprietors which formerly could not be worked at all. Formerly, explosions were frequent; for the moment there was a rush of foul air it exploded, and rarely accumulating, the mischief was not extensive. Now, the men, with the fallacious protection of the lamp, and a complicated system of ventilation, veuture into unknown dangers, and tread, in increased numbers, continually on the vergo of a volcano, which the slightest irregularity fires with terrific effect.

"It is the invariable rule in such cases, to lay the blame on the workmen. They are said to be reckless and imprudent, and such they very probably are; for it is the nature of exposure to continual danger, which no care of their own can avert, to make men reckless of their lives and that of others. Of twenty or thirty people buried in the bowels of the earth in a fiery working, the safety of all depends on the prudence of each particular one; but more especially on the vigilance of the poor little children, ten or twelve years of age, or sometimes much younger, shut up in impenetrable darkness, to perform the monotonous task of opening and shutting the door, which is the key to life and death of all in the mine. If one of these helpless wretches fall asleep over its miserable task, the destruction of all the steadiest workmen in the mine is sealed. If any escape the explosion, they know nothing of its cause, and if all perish, it is very easy to lay the blame on the dead. Usually the matter is hushed up with some brief, perhaps sincere, regrets at the fatality, and a melancholy accumulation of the widows and orphans, and an assurance that all is now "safe,"—which may be equally said of a gun after it is fired, and before it is loaded again. Sometimes a little investigation takes place, when somebody is found to conjecture that somebody in the mine, to get more light, unscrewed the top from his lamp, and lighted an open candle; while the probability is, that, from the neglect of a child, or the general want of ventilation and superintendence, the air had fouled imperceptibly, until some unlucky blast drove an inflammable fragment against a lamp, which, with that carelessness which continual exposure to danger invariably engenders, had been suffered to get red hot, and involved youth and age, carelessness and imprudence, in one common destruction.

"We know that the commercial wants of the country require fiery seams of coal to be worked—we know that, so long as they are worked, no human skill can prevent occasional explosions, because gas will occasionally, but rarely, be extricated in volumes, which no ventilatiou can carry off. But we contend that the great majority of explosions happen from no such cause; and it is the opinion of all the persons most conversant with the subject, whom we have met, that by careful superintendence, liberal supply of air, choice in the selection of workmen, and general good managemeut, and by refraining from working very dangerous seams, accidents might be immensely reduced in number; and it is notorious, that in well-managed collieries, accidents are comparatively rare, while some which are neglected, are complete charnel-houses.

"The strongest case against the coal-owners, is their refraining, from mere indifference or avarice, from the use of Messrs. Upton and Roberts's lamp. Poor Roberts, whose death we recently recorded, and who, did the world do him justice, would be esteemed

a far greater benefactor to his class than Davy, was a working miner in Whitehaven, and labored in many other collieries. Having sound common sense, he was not satisfied with the common story of explosions always arising from a sudden extrication of gas. He knew that explosions took place indifferently in mines in which there was the most "dirt" —that is, accumulation of gas from a sluggish ventilation, or in which there was a regular and rapid discharge, and strong ventilation. Having practical knowledge, and an inquiring mind, he ascertained that Davy's lamp was radically defective in principle—a useful plank in the road to safety, but a rotten bridge to rely on. He found that in a vitiated atmosphere it would burn with a tolerable light, until the gauze became so hot that it would fire any highly inflammable solid, such as a bit of bituminous coal driven against it; and that air vitiated far below the point which would extinguish the flame, or produce much perceptible effect on it, if driven in a current would mechanically penetrate the meshes of the gauze, and explode.

"Roberts' plan was an exceedingly simple one It was to admit the air to feed the flame only from below, and, with additional precautions, and to surround the gauze with a cylinder of glass or talc, which, if broken, would still leave it a good Davy lamp. The truth of his principle, and the efficacy of his lamp, were incontrovertibly established before the committee of 1835, on the evidence both of scientific and practical men. But he was unable to bring it into use—it cost money, and would have saved nothing to the coal-owners; and after a life of struggles, this most meritorious man died in poverty, leaving a helpless family, unmarked by scientific distinctions or national gratitude.

"The committee of 1835 consisted largely of coal owners, whom it might be invidious to name. They collected a black catalogue of misfortunes, if such they may be called. From "very defective" returns, they made out a list of 954 lives in 25 years. In the Tyne and the Wear districts alone, the loss of 1,600 lives from 1710 to 1835 was established. They condemned the "parsimonious" system of shafting—they "reprobated" the inadequacy of the partition for ventilation, and the use of wood, to this day almost universal—and they pronounced a decided opinion that Messrs. Upton and Roberts's lamp was the only one entitled to the name of a "safety lamp," for it was the only one which did not explode under the dangerous contingencies ascertained to be most frequent in coal mines. Yet we never heard that any of them ever acted on their own recommendations, and certainly no measure was introduced, based on them.

"It may be reasonably asked of us, what remedy we propose to meet the evils we have detailed? We admit that no general system of regulation and superintendence by the Government would be at all efficient. We would prohibit the employment under ground of lads under a certain age, and of female children altogether. We would have the Government declare officially, on the report of a committee of men of science, which is the best lamp—whether Messrs. Upton and Roberts's, or any other—offer a large reward for improvement, and make it penal on coal owners to allow the use of any other, and manslaughter on the overlookers if death occurred in any case where any other was used. We would have itinerant inspectors to repair to the seat of any accident, whether from fire-damp, or, in the more rare cases of choke-damp, fall of the roof, or irruption of water, or in any other way; and report whether everything was in proper working order—whether the mine was conducted with due regard to the safety of those employed in it—or whether the case was one to be visited with penalties. Such measures, we have no doubt, would save innumerable valuable lives, besides greatly improving the character of the mining population, and conciliating its affections to a paternal government.

"Should all these measures fail, we have yet one to propose, and that is on the old military principle of Frederic of Prussia—never to recognise an "accident." We would impose a very heavy deodand—say £500—for every loss of life in a colliery. If the proprietors were subject to such consequences as this (how infinitely below the value of the life of a man!), we suspect they would take very good care not to work dangerous mines, and in all cases take all human means to render accidents as rare as possible. There is no class of men who need an enlightened sympathy so much as the colliers, or who meet so little of it. The life of a factory child is a paradise to that of a parish colliery apprentice. The moral and physical condition of the latter class, is often wretched beyond all description, and not the less so that they are buried beneath human sympathy. Nobody thinks of abridging their hours of labor, or fixing an age at which they may be lawfully interred alive. Why is this? Why is it that the law, which meddles with everything, meddles not with them? It is so, largely, we believe, from ignorance of their condition, but yet more largely because coal owners are mostly landed legislators, and find sympathy with other people's workmen a cheaper enjoyment than sympathy with their own."

NEW WEAPONS OF WAR.

The following observations on the advantages which, in case of war, those nations will possess that have profited by the improvements and inventions of modern times, and have adopted the means suggested for increasing the powers of destruction, are translated from the *Fanal*. It will be seen, the writer speaks in an exaggerated tone, and that he over-estimates the preparations of England, but there is much in his remarks deserving attention:—

"If war should now break out, we shall see the most destructive weapons brought into action, which have been invented during the last twenty-five years, by the advance of mechanical and chemical science. Unfortunately, France alone has refused to profit by the new discoveries. We hope she may not be made to feel how much the commissioners of artillery, whose duty it is to examine and try inventions relating to war, have left her behind other powers, by their obstinate rejection of excellent improvements, which Russia and England have been anxious to adopt, by recompensing the inventors.

The ranks of the French army will be wofully cut down by the ball howitzer of the Hanoverian General, which has been introduced in Prussia and England, The French ships will suffer greatly from the Paixhan cannon, with which the English have ballasted their ships of the line, instead of using gravel. It is a terrible implement of war, which throws bombs instead of balls, and can be mounted in battery in less than a day. Add to that, the hundreds of steam ships, which carry, at the head and stern, two enormous cannons of that kind, for throwing bombs of 80 pounds weight, filled with a bushel of *biscaiens*; one bomb, well directed, being enough to sink a ship. We need not speak of Congreve rockets, a hundred of which, directed horizontally against a regiment of cavalry, is sufficient to put it to flight; nor of the muskets charged at the breech, of which Russia possesses many hundred thousands, whilst France is yet discussing the merits of it. There is also the air cannon of M. Perrot, which throws 500 balls in a minute, and which Marshal Soult contemptuously told him in our presence, he might sell to the enemy; and the ball howitzer, which bursts in the body, and sets fire to every thing it touches, a formidable weapon, inasmuch as it may be substituted for balls, and produce ten times more destruction.

We should never have done, were we to enumerate all the instruments of war which France refuses to appropriate, and which her enemies are anxious to adopt. It remains to be seen, whether the valor of the French can overcome these disadvantages, and whether the soldiers, when compelled to fight with unequal arms, will not be demoralised, and run away, calling out treason!

But there is still time; France should make an appeal to her numerous inventors. She should reconstruct a commission of examination, composed of competent individuals, of men young enough not to have become mere routinists, and she would soon possess, not only all the weapons that are in use by other powers, but also the advantage of the energies and genius of her own inventors, which have been so long discouraged.

EXPIRED PATENTS.

PATENTS THAT HAVE EXPIRED DURING THE WEEK ENDING AUGUST 15, 1840.

ENGLAND.

ERSKINE HAZARD, North America, and Norfolk-street, Strand, engineer, for *a method or methods of preparing an explosive mixture, and employing the same as a moving power for machinery*, partly communicated to him by a foreigner, Aug. 12.

SPECIFICATIONS.

A LIST OF SPECIFICATIONS

ENTEREO AT THE ENROLLMENT OFFICE, UP TO THE WEEK ENDING AUGUST 15, 1840.

(*Continued from page* 100.)

ENGLAND.

WILLIAM ISAAC COOKSON, of Newcastle-upon-Tyne, *certain improved processes or operations for obtaining copper and other metals from metallic ores*, Aug. 5.—First, the inventor claims the processes or operations of reducing sulphuret of iron, contained in the rich sulphurous ores, to protosulphuret, by distilling sulphur from such ores, and of obtaining sulphuretted hydrogen gas, by means of dissolving the iron of this protosulphuret, by muriatic or sulphuric acid, to facilitate the obtaining of copper and silver from such ores.

Secondly, claims the method of converting sulphurets of copper and iron, contained in the sulphurous ores, into oxides, for obtaining muriate of copper, capable of producing metallic copper.

Thirdly, claims the method of converting the sulphuret of copper, of the sulphurous ores, into sulphate of copper, by exposing such sulphuret to the action of atmospheric air at a low red heat, and of converting sulphuret iron, contained in such sulphurous ores, into oxide, capable of producing metallic iron.

Fourthly, claims the method of reducing sulphuret of iron to protosulphuret, by roasting the ores, and then fluxing the mixture with coke or coal.

Fifthly, claims the use of sulphuret of copper, obtained by the decomposition of the Regule, for decomposing sulphate of copper, obtained from the sulphurous ores, for obtaining sulphurous acid, and metallic copper therefrom.

Lastly, the use of sulphuric acid for facilitating the obtaining of copper from the oxide ores.

JOSEPH NEEDHAM TAYLER, Plymouth, Devon, Post-captain R. N., *improvements in steam-boats and vessels, making applicable the power of the steam-engine to new and useful purposes of navigation*, Aug. 8.—One improvement is for protecting, while riding at anchor, the paddle-wheels against the action of the waves. Over the paddle-wheel is fixed a cap or case, that has a segment of a cog-wheel fixed on its upper surface, where a pinion and chain regulate the movements as required. Thus, in riding at anchor, the cap or case may be moved before each

paddle-wheel, or when scudding, the cap or case may be placed behind each paddle-wheel, so as to screen them from the action of the waves.

The other improvement consists in the method of applying the power of the engine to the purpose of raising the ships' anchor. On the main shaft of the engine is placed a cylindrical clutch box, which, when put in gear with the revolving shaft, causes the connecting endless chain or messenger to work the windlass or capstan that is above deck. Hence, by a simple arrangement, while one side of the capstan is heaving in the anchor, the other side may be used for veering it out, for purposes of mooring.

AMAND DEPLANQUE, of Lisle, France, and Leicester-square, *improvement in looms for weaving*, Aug. 8.—The drawings attached to this specification are so complicated, that it will be impossible to give a correct explanation of these improvements; we must, therefore, confine ourselves to the many claims.

First, to the two lateral uprights of the frame, the inventor has added a third; to serve as a support to the arcade bar, and as a base to the front upright, supporting the upper part of the loom.

Second, the use of casting iron pieces, to serve as supports to the axis.

Third, the movement of the upper part of the loom is obtained by the eccentric platform.

Fourth, the use of toothed wheels to give the movement of rotation to the eccentrics.

Fifth, regulating the movements of the loom by the fly-wheel.

Sixth, the eccentric platform gives the facility to insert a tissue more or less compact.

Seventh and Eighth, the construction of the batten, and changing the shuttle, by means of the vertical raising of the triangle.

Ninth, the means employed for the descent of the treddles by the lever.

Tenth and Eleventh, the adoption in the interior of the loom of the mechanism for the extra ornamental thread, whereby is obtained an economy of 7-8ths of the card.

Twelfth, the facility of weaving cloth with any sort of materials, and of any size.

Thirteenth and Fourteenth, not only an economy of workmanship, but a great perfection and regularity in the fabrication, obtained by means of the eccentric.

Fifteenth, the celerity of the loom, with its extra ornamental threads, and changing of shuttles, at the rate of 70 to 80 strokes per minute.

Sixteenth, the rolling of the cloth fabricated, by means of the pressure exercised by the levers.

Lastly, the pickers, which are in iron.

EDMUND RUDGE, of Tewkesbury, Gloucester, tanner, *a new method or methods for obtaining motive power for locomotives and other purposes, and of applying the same*, Aug. 8.—These improvements are for the construction and application of a new form of atmospheric engine, which may consist of two, three, or more open-topped cylinders, placed either vertically or horizontally, the piston rods of which are connected with two or three throw cranks. The air below each piston in the cylinder is condensed by a jet of steam, when the preponderating influence of the atmosphere on the external surface of the several pistons produces the available power.

The cylinders are lubricated by means of a small funnel on the top of the piston rod, whence the oil flows into a hollow space within the rod, and thence into a groove turned in the piston.

In order to gain a reserve of power, for any particular purpose, a large cylindrical receiver is filled by a condensing air-pump placed on either side, and connected with the main-shaft of the engine; thus when the carriage is descending a hill, the air-pumps will compress the air into the large cylinders, which again will supply the air for working the pistons while ascending a hill.

ROBERT WILLIS, of the University of Cambridge, clerk, Jacksonian professor, *improvements in apparatus for weighing*, Aug. 12.—The inventor claims the mode of constructing weighing machines, wherein the beam is made to take up, successively, a series of weights, in such manner that, when taken up, each weight is so held as to be without swing or action, in respect to the beam.

At one end of the lever beam is a Medhurst pan, and at the reverse end are angular notches, which take up, in succession, the weights that are arranged in an upright rack with slots to hold them. The extreme end of this part of the beam points to a vertical index, that gives the amount of weight, or number of weights, taken from the rack by the notched end of the beam.

DAVID NAPIER, York-road, Lambeth, engineer, *improvements in the manufacture of projectiles*, Aug. 12.—This improvement is for compressing lead into shape of bullets or shot, in contradistinction to casting.

The first method is to place, and work in a suitable frame, plungers, at the bottom of which are dies conformable to half of the ball, to form the bullet or shot; by the simple application of a rod to work knee joints, these dies are made to close upon the rod of lead, so as to form a bullet at each stroke of the plunger or piston.

The second plan is to form hemispherical recesses on the periphery of rollers, which are placed in juxta-position; hence the rod of lead in passing between these rollers as they rotate, will be formed into bullets or shot.

ROBERT BEART, of Godmanchester, Huntingdon, miller, *improvements in apparatus for filtering fluids*, Aug. 8.—Two perforated or reticuled plates of zinc are placed with their concave sides close together; these, when covered with filtering paper, or some other filtering articles, such as felt, &c., are held in a clamp frame, for the convenience of taking out the plates, when required to clean them; a tube, of course, must be introduced to the interior of the filtering plates, in order to carry off the clear water. By this simple method, a soldier might carry a filtering machine in the crown of his hat, and when near a pond or tank of water, he need only throw in the machine, and draw the filtered water up by means of suction, and allow it to flow as from a syphon.

The second method is to gain a larger filtering surface, by placing layers of stone in a vertical position, hence the water passes through them into the channel between, where pipes are arranged to carry off the filtered water.

JOHN WERTHEIMER, of West-street, Finsbury-circus, printer, *certain improvements in preserving animal and vegetable substances and liquids*, Aug. 8.—The meat is placed in suitable receivers, where a perfect vacuum may be formed; two small holes are made at the top, one about one-eighth of an inch, the other about the fiftieth of an inch; immediately over these holes, is placed a cotton or other soft pad; over which is held down, by a spring, a circular ring, perforated with fine holes to admit the gas from the pipe to pass through; hence, the air that is within the receiver where the meat is placed, must pass out through the small holes, and between the space of the ring, in order to support the combustion of the gas flame, which now forms a dome.

As soon as the air has passed off, the holes must be closed or soldered down, and the receiver holding the meat must be placed for several minutes in a heated chamber, about 212 Fahr., in order to consume all the remaining atmospheric air that may have escaped burning.

ENTERED AT THE PETTY BAG OFFICE, UP TO THE WEEK ENDING AUGUST 15, 1840.

(Continued from No. 55.)

ENGLAND.

JAMES SMITH, jun., Spital-works, Chesterfield, Derby, and FRANCIS SMITH, of the same place, lace manufacturers, and co-partners, *certain improvements in machinery for the manufacture of figured bobbin net or lace*, July 28.—These improvements are a substitute for the tappet-wheel, and consist in the novel construction and use of endless belts, bands, or chains of tappets or steps, whereby the raisers and fallers are actuated, so as to work the sliding horizontal bars that guide the warp threads. There is also an improvement for causing, when required, a double rise. It would be difficult to explain these without the aid of drawings, but it depends on the pecular formation, as well as the rotation of two cams; while one relieves the toothed rack that is held by a toothed lever, the other cam, in turning, causes the lever with the toothed rack at its end to give a double rise.

THOMAS MYERSCOUGH, of Little Bolton, Lancaster, manager, and WILLIAM SYKES, Manchester, machine-maker, *certain improvements in the construction of looms for weaving or producing a new or improved manufacture of fabrics, and also in the arrangement of machinery to produce other descriptions of woven goods or fabrics*, Aug. 5.—These improvements are more suitable to the manufacture of imperial counterpanes or quiltings, as well as knotted counterpanes.

First, the tappets or links of an endless belt or chain are peculiarly shaped for the purpose of varying the position of the links, hence the raisers or fallers can be actuated according to the figure required.

Second, the beating up of the slay or reed is managed by the driving shaft, and a stud pin of the lever connecting the two slides into a slot, which holds back the slay or reed while the shuttle is traversing the whole of the loom.

Third claim consists in the movement of the pickers, which cease to act when the weft of the shuttle breaks.

Fourth claim is the method of stopping the loom, which depends on the throwing of the shuttle.

Fifth claim consists in the arrangement of small rollers at one end of the shuttle, over which the weft from the bobbin passes, and is held there by another roller, attached to a forked lever with an easy spring; thus, should the weft break, the spring roller, being relieved, presses forward, and causes a stud to project in the shuttle, which stud prevents the shuttle from being moved by the picking stick, the result of which is, the action of the loom ceases.

Sixth claim is for the method of pressing up the loops for forming the knots of the counterpanes or quilts.

NOTICE.

In accordance with the determination expressed in our 26th Number, of giving one month's clear notice to Inventors, before publishing their specifications, we hereby inform the following Patentees, that their specifications will be published in the "INVENTORS' ADVOCATE" of Sept. 26. Each party will receive, in addition, a *private* communication to the same effect.

Robert Varicas, Burton Crescent, surgeon, due Sept. 16.
William Crofts, Radford, Nottingham, machine-maker, due Sept. 16.
Jean François Victor Fabien, King William Street, London, gent., due Sept. 16.
Thomas Craddock, Broadheath, Radnor, farmer, due Sept. 16.
Richard Smith, and Richard Hacking, Bury, Lancaster, machine-makers, due Sept. 16.
Isham Baggs, Cheltenham, gent., due Sept. 17.
Moses Poole, Lincoln's Inn, gent., due Sept. 17.
Samuel Seaward, Canal Iron-works, Poplar, engineer, due Sept. 17.
Sir William Burnett, Somerset House, Middlesex, Commander of the Royal Hanoverian Guelphic Order, due Sept. 19.
John Jackson, Manchester, nail and bolt manufacturer, due Sept. 19.

Thomas Stirling, Limehouse, patentee of the "Rapid Filterer," dec Sept. 20.
Francis William Gerish, East-road, City-road, patent hinge-maker, dec Sept. 20.

FOREIGN PATENTS.—FRANCE.

A LIST OF PATENTS GRANTED BY THE FRENCH GOVERNMENT FROM JAN. 9, TO FEB. 19, 1839.

FIRST QUARTER OF 1839.

(By Royal Decree, dated Aug. 26, 1839.)

No. 1. Mdme. Casaubon, Egérie Anne, and Granal, Jean Pierre Hyacinthe, 15 years, for *a new process of preparing and manufacturing tobacco and snuff*, Jan. 9, 1839.

2. Duclos, Pierre Louis, 5 years, for *a new elastic saddle, with iron saddle bows*, Jan 9, 1839.

3. Morin, Jean Henri, represented by Richon, 10 years, for *a new system of stoves, producing the maximum of useful effect*, Jan. 9, 1839.

4. Beaulard, Alexandre Edme, 15 years, for *extracting four different products from soap suds, hitherto lost*, Jan. 14, 1839.

5. Brunier, Louis, third addition to patent for 15 years, dated Nov. 25, 1837, for *a new system of producing a vacuum by a hydro or gaso-pneumatic principle, according as the apparatus works by water or steam*, Jan. 14. 1839.

6. Casaubon, Jean, 5 years, for *a new process of lighting dark houses by means of a wood-work covered with glasses (* verres à crochet?)*, Jan. 14, 1839.

7. Ganilh, André, addition to patent for 10 years, dated Dec. 5, 1838, for *a new system of steam engine*, Jan 14, 1839.

8. Priot, Napoleon, addition to patent for 5 years, dated Oct. 3, 1838, for *the composition of common, ordinary, and fine bitumens of various colors, applied to paving streets and footways, as well as to flooring, walls, and building purposes*, Jan. 14, 1839.

9. Sorel, Stanislas, addition to patent for 15 years, dated Oct. 3, 1838, for *new metallic alloys to be employed advantageously, instead of iron and brass castings*, Jan. 16, 1839.

10. Carville, Felix Auguste Joachim, second addition to patent for 10 years, dated Sept. 5, 1838, for *a mechanical means of effecting a continuous jet applied to syringes of all uses and sizes, and applicable to portable jets d'eau, pumps, &c., and generally to all purposes where a continuous jet is required*, Jan. 18, 1839.

11. Jollet, Jean Baptiste, 5 years, for *a new press of double effect and with piston*, Jan. 18, 1839.

12. Buffet, Jean Louis August, 5 years, for *a new flute, and for the application of his system to the alto flute and to all other wind instruments*, Jan. 22, 1839.

13. Légé, Jean, and Praux, Edme Noël David, 15 years, for *a means of transferring lithographic impressions on earthenware*, Jan. 22, 1839.

14. Letestu, Marie, 5 years, for *a universal pump, without clapper or piston, and which may be made entirely of metal*, Jan. 22, 1839.

15. Winkel, Alexandre Nicholas Mathurin, and Volhaber, Gustave Adolphe, 10 years, for *a mechanism for the purpose of closing and opening Venetian blinds*, Jan. 22, 1839.

16. Baillot de Malpière, David, addition to patent for 15 years, dated March 9, 1838, for *mechanical apparatus for extending plaster of paris stone, and for burning the same*, Jan. 26, 1839.

17. Bechade, son, Simon, 10 years, for *a machine for cleaning (egrainer) grapes, which he calls égrappoir à godets*, Jan. 26, 1839.

18. Bidreman, Brothers, Nicolas and Philibert, addition to patent for 10 years, dated July 30, 1836, for *new processes of manufacturing plaster*, Jan. 26, 1839.

19. Brisbart, Edouard Antoine, represented by Boquillon, 5 years. for *boot-straps, which he calls articlides*, Jan. 26, 1839.

20. Durant Morimban, Pierre Jean François Henri, 15 years, for *a process of enamelling wrought and cast iron, and copper*, Jan. 26, 1839.

21. Jacquemynes, Auguste, 5 years, for *a steam apparatus for heating apartments*, Jan. 26, 1839.

22. Pourrageand, Jean, second addition to patent for 5 years, dated Jan. 30, 1838, for *a machine or carriage for the purpose of levelling land*, Jan. 26, 1839.

23. Winkel, A. N. M., and Vollhaber, G. A., addition to patent for 10 years, dated Jan. 22, 1839, for *a mechanism for the purpose of closing and opening Venetian blinds*, Jan. 26, 1839.

24. Chaillot, Andre Etienne, 5 years, for *a process applicable to the manufacture of harps*, Jan. 31, 1839.

25. Dunod, Jean Baptiste, 15 years, for *a machine for spinning, drying, twisting, and rolling silk by one operation, and a mill for organsine silk*, Jan. 31, 1839.

26. Durand, Brothers, 5 years, for *a machine for dressing silk coccoons*, Jan. 31, 1839.

27. Paine, Elijah, represented by Perpigna, 15 years, for *a new motive power on the principle of galvanism*, Jan. 31, 1839.

28. Gerish, Francis William, represented by Molinard, for 10 years, for *mechanism, which he calls reactors, being self-acting fastenings to doors, windows, shutters, &c.*, Jan. 31, 1839.

29. Huet, Antoine Jean Louis, 10 years, for *a new system of movement, applied to railway locomotive engines*, Jan. 31, 1839.

30. Irroy Stanislas, 15 years, for *a heating apparatus*, Jan. 31, 1839.

31. Leda, Antoine François Marie, 5 years, for *a pump with pulley and two gearings, instead of a lever*, Jan. 31, 1839.

32. Luszelewki, Adam, 15 years, for *a new system of paving, flooring, and executing hydraulic works*, Jan. 31, 1839.

33. Pelouse, Théophile Jules, 15 years, for *a new process of manufacturing sulphuric acid*, Jan. 31, 1839.

34. Polonceau, Antoine Remy, addition to patent for 15 years, dated May 12, 1838, for *various processes of laying down bitumen, and of making roads of flint stone covered with bitumen*, Jan. 31, 1839.

35. Barraud, Felix André, 15 years, for *clarifying in large quantities, muddy water and other liquids*, Feb. 6, 1839.

36. Brisset, Aignan Placide, 10 years, for *a new system of transporting earth*, Feb. 6, 1839.

37. Cooper, Richard Bellin, represented by Truffaut, 10 years, for *various improvements in muskets and fowling pieces, pistols and other portable fire-arms*, Feb. 6, 1839.

38. Crompton, Bousor, represented by Truffaut, addition to patent for 10 years, dated Sept. 5, 1838, for *a new process of manufacturing white lead, (carbonate of lead)*, Feb. 6, 1839.

39. Davies, John, represented by Perpigna, 15 years, for *improved means of burning smoke, and of thus effecting a saving of fuel, or of increasing the heat in steam boiler furnaces or other fire-places; also for preventing the explosion of steam-boilers or generators*, Feb. 6, 1839.

40. Eveillard, Casimir Alexandre Jules Pierre, 5 years, for *several apparatuses for preventing robberies in apartments during the absence of the occupants*, Feb. 6, 1839.

41. Hamond, Charles, represented by Renaud de Vilback, 10 years, for *the construction of locomotive steam-engines*, Feb. 6, 1839.

42. Laury, Gabriel Jean Julien, fourth addition to patent, for 15 years, dated Dec. 30, 1836, for *new arrangement of chimneys, and heating stoves or fire-places, applicable to any locality*, Feb. 6, 1839.

43. Locatelli, Louis Melchoir Balthazard, 15 years, for *a new file*, Feb. 6, 1839.

44. Luke Hebert, represented by Reynaud, addition to patent, dated Aug. 19, 1836, for *improvements in machines for grinding corn and sifting flour*, Feb. 6, 1839.

45. Michotte, and Co., 10 years, for *a new double pressure machine for making bricks*, Feb. 6, 1839.

46. Perlet, Jean, 5 years, for *a machine for raising water to different heights, to be used either for irrigating land, or as a motive power*, Feb. 6, 1839.

47. Perrot, Louis Jerome, seventh addition to patent for 15 years, dated Sept. 11, 1835, for *machines for printing tissues and paper*, Feb. 6. 1839.

48. Raulin, Jean Baptiste, 10 years, for *the application of a system of springs by compression of air to the hanging of carriages, and to any other purpose where elasticity is required*, Feb. 6, 1839.

49. Rigolet, Pierre Felix, addition to patent for 5 years, dated Oct. 12, 1838, for *compasses for taking the exact measure of the foot*, Feb. 6, 1839.

50. Roy, Blimond, 5 years, for *a new lock*, Feb. 6, 1839.

51. Ryland, John, represented by Truffaut, 10 years, for *the construction of new screw presses*, Feb. 6, 1839.

52. Sterlingue and Co., addition to patent for 10 years, dated June 6, 1838, for *currying thick hides by mechanical means*, Feb. 6, 1839.

53. Truffaut, Louis Henri Jules, 10 years, for *processes of smoothing and polishing window and crown glass*, Feb. 6, 1839.

54. Achet, Jean Jacques, Sanford, Henri, and Varral, William, addition to patent for 15 years, dated Sept. 29, 1838, for *a machine for reducing to pulp the knots and lumps in cotton, coarse linen, flax and hemp tow; and also for cleaning the refuse of cotton, and course linen rags employed in the manufacturing of paper, as well as flax, and hemp tow*, Feb. 12, 1839.

55. Baden, Jean Jacques Alexandre, third addition to patent for 15 years, dated Aug. 26, 1838, for *a new process of paving, and the composition of asphaltic bricks*, Feb. 12, 1839.

56. Baudrimont, Alexandre Edouard, a second addition to patent for 15 years, dated April 14, 1838, for *machines or apparatus for making casks and other like vessels, formed of parts united by hoops*, Feb. 12, 1839.

57. Grégoire and Co., represented by Langlois, 5 years, for *processes of manufacturing glass from marble*, Feb. 12, 1839.

58. Grimoux, Julien François, represented by Grimaud, fourth addition to patent for 15 years, dated July 25, 1837, for *a new system of propelling vehicles*, Feb. 12, 1839.

59. Lacroix, Elie, 10 years, for *a watch or clock-work cylinder, fluted spirally, to which a spindle is fitted, rolling off from the chain with the weight; the fluting is intended to prevent the overlapping of the rope or chain, which frequently occurs with a smooth cylinder*, Feb. 12, 1839.

60. Hussenet, Marie Ange, 5 years, for *an eccentric rotary pump*, Feb. 12, 1339.

61. Nicolet, François Antoine, 15 years, for *a cutting apparatus on a plate of metal*, Feb. 12, 1839.

62. Sorlin, François, and Marie, Pierre, 10 years, for *substituting ornamented gilt zinc for wood and brass, in the manufacture of clocks, vases, and other fancy works*, Feb. 12, 1839.

63. Trotin, son, François Ange Eugène, and Mme. Vignié, Françoise Catherine Marie, 15 years, for *a new system of rolling, which may be used instead of forging for various sharp-edged instruments, such as*

blades of knives, razors, penknives, surgical instruments, and swords, Feb. 12, 1839.

64. Arrault, Henry, and Sotteau, Louis Jacques, 5 years, for *a bitumen, which they call "ironbitumen," and "mosaic iron bitumen,"* Feb. 19, 1839.

65. Baudelier de Béfort, 10 years, for *means and processes applied to advertising by handbills*, Feb. 19, 1839.

66. Burle, Louis Charles Simon, represented by Ardoin, 10 years, for *a new system of dry-docks, for the purpose of repairing vessels*, Feb. 19, 1839.

67. Chautriaux, Joseph Pierre, 5 years, for *a bobbin for the purpose of winding skeins and bundles of silk, wool, and cotton*, Feb. 19, 1839.

68. Cody, sen., Pierre, addition to patent for 10 years, dated Nov. 24, 1838, for *an apparatus on an improved inclined plane, for concentrating liquids, acting by steam at different pressures*, Feb. 19, 1839.

69. Coqnet, Nicolas, 5 years, for *a powder for cleaning the head, called by him "capophile,"* Feb. 19, 1839.

70. Dulery, Renault, addition to patent for 15 years, dated Nov. 24, 1838, for *processes of manufacturing bituminous mastics, and for various applications thereof*, Feb. 19, 1839.

71. Fage, Vital, and Lamarque, Pierre, addition to patent for 10 years, dated April 14, 1838, for a *mechanical bedstead with folding frame*, Feb. 19, 1839.

72. Leroy, Charles Philippe, addition to patent for 5 years, dated Jan. 6, 1838, for *a heating apparatus with an interior and exterior current of air*, Feb. 19, 1839.

(*To be Continued.*)

FOREIGN CORRESPONDENCE.

FRANCE.

M. Walferdin has communicated to the French Academy of Sciences, the result of some observations which he made on the temperature of the sources of the rivers Marne, Seine, and the Meuse, all of which issue at a distance of nine myriametres from the chain of calcareous mountains that have been named by Buffon the *Plateau de Langres*. In making these experiments, M. Walferdin used a thermometer of a new kind, contrived by himself, which he calls *metastatic thermometers*, and which are so extremely sensible to minute variations of temperature, that the thousandth part of a degree, centigrade, is indicated by them. He determined the latitude, longitude, and height of the places where he made his observations, and also the geological character of the country whence the waters spring, and the strata where they come to the surface.

The observations were made from the 10th to the 23d October 1839, at about eight o'clock in the morning. M. Walferdin has ascertained that the source of the Marne, situated near Langres, rises from the lower portion of cntrochal limestone:—the temperature on the 18th of October was 9·669. The source of the Seine, which rises in a valley near Evergereaux, formed of the upper oolites formation indicated, on the 23d Oct., 9 deg. 182. That of the Meuse, which springs from the lower beds of the lias formation in the Plateau de Pouilly, was on the 10th of October, 10 deg. 950.

BELGIUM.

THE RIGHT OF PATENTEES TO USE THE ROYAL ARMS.

The Minister of the Interior has sent the following circular to the governors of the Belgian provinces.

"The question has arisen—whether the proprietor of a patent of invention, of improvement, or of importation, has the privilege of fixing the government arms against his house or manufactory, and of having them engraved on his bills, letters, &c. in the same manner as the tradesmen of the Court are authorised to use the Royal arms?

"There is nothing contained in the laws and the regulations of the administration to prevent a patentee from using the *government arms*, which, as you know, present a marked difference from the *arms of the crown;* but it is necessary, at the same time, to indicate by a motto added to the arms, the nature of the right to use them. This motto may be by patent of invention, improvement, or importation, as the case may be. As to the arms of the crown, those only are privileged to use them who have obtained permission to do so from their Majesties.

"In accordance with a despatch from the Minister of the Interior, dated the 25th of this month (July), I request you to attend to the preceding instructions, and to take care that no patentee uses the royal arms, but only those of the government, unless by special authority; and that the arms when used are accompanied by a motto to the effect already stated; and also that this privilege be discontinued when the term of the patent expires."

The vans for the delivery of goods, sent by the Brussels railways, commenced running on the 1st inst., and have attracted attention in Brussels, from the circumstance that this is the beginning of the plan of government for becoming general carriers of goods as well as passengers. The vans used for the purpose are on springs, and, besides the driver, they are accompanied by two other persons to assist in taking care of and in delivering the goods.

The average prices of wheat and rye in Belgium, in the month of July, from 1835 to 1840, was as follows:—

	WHEAT.	RYE.
In 1835.....	15f. 93c.....	9f. 54c.
1836.....	16 14	10 35
1837.....	17 09	11 79
1838.....	21 69	11 88
1839.....	24 08	12 69
1840.....	24 22	15 92

The receipts on the Brussels railroads during the first six months of the present year, amounted to 2,282,152 frs. During the same period in 1838, the receipts amounted only to one half that sum, or 1,185,579 frs. The extent of the lines then opened, however, was much less than at present, for during part of the first half year of 1838 there were only six branches in operation, whilst, during the first half year of the present year, the number of branches had amounted to fourteen. At the present time, when there is an extent of road of 329 kilometres in operation, the expense of the working is not greater than it was in 1839, when the railroads in operation did not exceed 266 kilometres.

The Grand Duchy of Luxemburgh has issued a new tariff of duties, which is a copy, with modifications according to circumstances, of that of Prussia. In general, the duties of the new tariff, compared with the former one, are in favor of Belgium; but the establishment of differential duties is very objectionable, as all the advantage in that respect is in favor of Prussia; in the proportion that where Prussia pays one florin, Belgium is to pay five.

The *Independant* says, that the commercial transactions at Antwerp have been greatly influenced by the existing differences between the powers of Europe. In the expectation of a war, or at least, on the possibility of conflict, the holders of goods have raised the prices of their articles, to which the buyers, however, refuse to agree, as they rely on the maintenance of peace. It is certain, however, that though the latter opinion is generally entertained, the premiums for insurance have been increased, and double premiums are required to insure against the risks of war ships coming from distant ports. Insurances of this kind have been effected at Amsterdam, and it is stated that no difference is made in the premiums between the ships of Belgium, and those of France and England.

During the first six months of the present year, there were conveyed by the Belgian railroads 958,768 passengers. The total weight of the luggage of the passengers was 2,802,000 kilogrammes, and the transit of merchandise amounted during the same time to 44,200,000 kilogrammes of different products. The receipts during the half year amounted altogether to 2,282,152 frs.; 1,766,253f. of which, were received for the conveyance of passengers, exclusive of soldiers, and 452,134 frs. for the conveyance of goods.

The number of births registered in Brussels during the month of July, were 179 males, 176 females; deaths, 167 males, and 172 females; the total number of births being 355, and of deaths 339. The number of marriages in the month was 115, and there were two divorces.

The Society of Medical and Natural Sciences, at Brussels, has deputed four of its members to represent that body at the Rubens Fêtes at Antwerp. The burgomaster, Legrelle, intends to give a grand entertainment to all literary and scientific men collected at Antwerp on this occasion. The number invited is stated to amount to three hundred, comprising foreigners.

The *Fanal* Brussels paper states, that the rumors of war between France and the other European powers has produced a complete stagnation of trade in that city, and such is the want of confidence it has produced, that the banks refuse to discount the best paper.

The *Journal de Liége* states that a most remarkable phenomenon was observed there on Sunday week, towards noon, whilst the weather was perfectly clear and calm. A waterspout, six or seven feet in height, and about three or four feet in width, all at once, and without any previous indication, rose out of the river Ourthe, near the place where the passage boats land. When it had reached its greatest elevation, the waterspout passed to the other side of the shore with great rapidity, and with such force that it would undoubtedly have capsized the passage boat if it had not fortunately been on the bank near Vennes. The waterspout then suddenly disappeared without leaving any other trace of its recent presence than the agitation of the water, which appeared as if some heavy body had fallen into it.

On the night of the 5th inst., near midnight, when the sky was quite clear, the light of a meteor was observed near Brussels, moving in a direction from the southward to the north-west. It continued in sight many seconds, and then vanished imperceptibly without any explosion. Its path seemed to stretch over about four or five deg. The noise this meteor made in its flight, first directed attention to it. The noise was louder than that of the whizzing of a cannon ball, but not so great as that of a bomb. The *Fanal*, Brussels paper, which mentions this phenomenon, remarks that probably the diameter of meteors which traverse the atmosphere might be ascertained by the noise they make in rushing through the air. The height and the velocity would, however, first be required to form the data for such a calculation.

AUSTRALIA.

It is now officially announced that to all new colonies the South Australian principle is to be applied. This memorable resolution is declared by Lord John Russell in the following terms:—"It appears to me to be shown, that in new settlements, such as those comprised within the more recent of the two districts thus separated, a fixed uniform price constitutes the best method of disposing of the land. In sales by auction, the purchaser must wait a sufficient time for advertisement, and then may be outbid. He is exposed therefore to delay and to uncertainty. Both of these inconveniences are obviated by a fixed price. The fixed price also enables parties to know, before they leave this country, the exact quantity of land they can buy. Another circumstance, which, far from looking upon it with a jealous eye, I should consider to be a great advantage, is, that one uniform price for all country lands renders it probable that the best lands will be taken up first, instead of, by a difference of cost, tempting persons to begin with lands of secondary qualities. Thus none are forced into premature cultivation, but the different lands of the colony are successively occupied in the natural order of their advantages." The date of this despatch, for this declaration alone, deserves to be designated a new epoch in the history of colonization.—*South Australian Record.*

STEAM-BOAT ACCIDENTS IN AMERICA.

The *Journal of Commerce*, under the head of "Steam-boat Disasters," gives a fearful catalogue of accidents arising from the reckless manner in which the steam system of navigation is pursued in the United States. It was hoped that legislative measures would have been taken during the session of Congress just concluded, for putting a stop to so crying an evil, but the executive have, unfortunately, been too much occupied with their party banking absurdities to attend to questions in which the lives of the community are less immediately involved than their own dignity and places. The statement of the *Journal of Commerce* is as follows:—

"There were 41 accidents in 1839 on the western waters alone. This account of them is from a western publication:—Snagged, 21; struck upon rocks, &c., 7; destroyed by fire, 6; explosions, 4; collisions, 3. Of these, 23 were totally lost. Loss of property not less than a million of dollars. Lives lost by explosions, 39; by other causes, 7."

Several special additional cases are then recorded. The whole number of steam-boat accidents of a serious nature which have occurred in the United States, since the introduction of steam navigation, is stated at 272. The following is a summary:—

103 Explosions and collapses of boilers causing loss of lives	886
73 Striking on snags and sawyers	118
35 Shipwrecks, gales, and collisions	473
34 Fires from various causes	441
27 Unascertained causes	
272	1,921

The returns show about 450 wounded.

The aggregate loss of property by these disasters, is estimated at about six millions of dollars. The amount of steam-boat tonnage in the United States, according to the returns of 30th September 1839, was 199,569.

RAILWAY INTELLIGENCE, DOMESTIC AND FOREIGN.

London and Greenwich Railway.—On Tuesday, a special general meeting of this company was held at the London Tavern, for the purpose of adopting measures to raise a sum of £200,000, pursuant to powers granted to them by Act of Parliament, for the enlargement of their terminus, and widening the railroad, for the accommodation of the Croydon, Brighton, and South Eastern Railway Companies. Mr. Shadbolt, the chairman of the directors, was in the chair. The secretary read the report, which stated that the directors, not being able to effect an arrangement with the Croydon Railway Company, were obliged to go to Parliament to oppose their Bill, and to obtain one to enable them to enlarge their terminus and widen the railway. They accordingly obtained a Bill, to enable them to raise a sum of £200,000 for that purpose, and the mode by which they proposed to do so was by issuing shares, each of which would be changed for an old share on paying £6 10s. in the following manner:—£2 on allotment, £1 on the 15th January 1841, £1 on the 15th April subsequent, and £1 on the 15th of October. The report concluded, by stating that the traffic on the line had increased within the last six months over the previous six months to the amount of £1,889 2s. 1d., and the best understanding existed between the directors and all companies using the line. A long discussion then took place as to the issue of the fresh shares, and as to their relative position with the other shares. It was ultimately agreed that the sum of £200,000 should be raised in the manner proposed by the directors. Resolutions to that effect, also the adoption of the report, and some routine business having been gone through, the meeting separated.

Eastern Counties Railway.—To the Editor of the *Inventors' Advocate.*—Sir,—The terminus of the Eastern Counties Railway, in Shoreditch, was opened on the 1st of July, when it was stated, that the entrance would *immediately* be completed, by the removal of the houses; and a prospect was held out that something of a handsome entrance would be made; but from that time to the present, no progress is made, and the empty houses on the north side of the wooden gates stand *covered with placards and dirt.* Really, the directors can have but little pride in this property, to let such an eyesore remain; in my humble opinion it is a disgrace. Let them look at the entrance of any other railway, and they will surely blush when they cast their eyes upon their own. Do, Mr. Editor, prevail upon them, if in your power, to make their property *sightly* (which at present it is not), by removing these nasty old houses; for it is impossible they can derive any benefit from them by letting them stand as they now do.—I am, Sir, yours most respectfully, D. G.
August 20, 1840.

Grand Junction Railway.—It appears from the returns laid before the select committee on railways, that the claims for compensation for goods lost or destroyed on the Grand Junction Railway, made and allowed, from February, 1838, to March, 1840, amounted to £2,917 12s. 8d., of which £2,238 1s. 7d. was for damage arising from fire in the month of Aug. 1839.—*Railway Times.*

London and Brighton Railway.—Active preparations are making by the directors of the London and Brighton Railway Company, for the opening of the portions of the line from Croydon to Hooley-lane, and from Merstham to Balcombe. Orders have been given for engines and carriages, as well as for the necessary accommodation of passengers at the above places.

London and Birmingham Railway.—The receipts upon the Birmingham Railway last week were £19,056 10s. 6d.—*Railway Times.*

Proposed New Railway to London.—The course, as laid down in the plan before us, is, from London to Barnett, St. Alban's, Ampthill, Bedford, Wellingborough, Kettering, Market Harborough, and Leicester; from thence by the Midland Counties to Derby, and from thence, passing a few miles north-east of Uttoxeter, Cheadle, and Leek, to the Manchester and Birmingham line near Macclesfield. It will be seen by reference to a map, that this course is close upon the "crow flight" line for 40 miles north west of London; that it then diverges to the north in a curve to Derby, but never at a greator distance from the straight line than 10 miles. The result, should this line be executed, would be to lessen the travelling distance between Manchester and London from 210 to 175 miles; the latter being probably the nearest approximation to the mathematically straight line, and in no part of it presenting any great engineering difficulties, except perhaps in the chalk formation and on the high ground on which the water separates, for the Humber basin on the north-east, and for the Mersey basin on the west. At a recent meeting at Bedford, numerously attended by the great landowners, resolutions in favor of the proposed line were passed unanimously, and Mr. Whitbread, who is one of the largest owners of property in the county, said, that the greater the number of miles on his estate through which it should pass, the greater should be his support."—*Manchester Times.*

Great Western Railway.—The *Bristol Standard* says—"As the period approaches for the completion of the line from this city to Bath, public interest seems to increase, and our generally quiet townsfolk, shaking off their old apathy and conquering their well-known aversion to those novelties yclept 'improvements,' are stealing out in thousands watching the progress of the works, not a few biting their nails at the thought that they have suffered a good investment to pass by unheeded. This line now possesses, in a high degree, public confidence in Bristol, and, when fairly opened to Bath, Bristol will send forth her thousands, whirling along the beautiful banks of the Avon, to visit the sister city. We opine this will prove the most profitable portion yet opened, and we shall very soon be enabled to dispense with the old road and all its cumbrous apparatus, its slow movements and many disappointments, and avail ourselves of the the 'new order of things,' and 'go a-head,' steaming it in about fifteen minutes. Securely congratulating the directors on the prospect of the speedy termination of their labors in this the most difficult portion of their gigantic enterprise, we earnestly hope they will reap an abundant profit from the intercourse between those two populous cities, and behold an intimate union and community of feelings and interest spring up between the inhabitants of places so closely brought together. We have understood that the day is not fixed on which the opening will take place, the time being delayed a few days by the fallen arches at Temple-mead."

The New Railway Commission.—We understand that the railway department to be annexed to the Board of Trade, under the new Bill, is to be constituted at first on a very limited and economical scale. With this view, instead of appointing a whole Board of Commissioners and permanent engineer inspectors, the railway department has, we understand, been attached to the statistical branch of the Board of Trade, and placed under the general control and superintendence of Mr. Porter. The only additional appointments under the Bill consist, we are informed, of a barrister, at a salary of £500 per annum, to assist in the revision of by-laws, railway acts, and other important matters of a legal nature, which will devolve upon the Board under the provisions of the Act, and to conduct the general business and correspondence of the department under the superintendence of Mr. Porter; and one junior clerk, at a salary of £100 a year. With regard to the business of inspection, it is not, we understand, the intention of Government, in the first instance, and until more experience has been had of the working of the measure, to make any permanent appointment of an inspector-general, but to employ, from time to time, as occasion may arise, some officer of the Royal Engineers, or other competent person, to perform the duties of an inspector, at a fixed rate of remuneration.

Booking Parcels by Railways.—The following letter, which deserves attention, appeared in the

Railway Magazine of last week:—To the *Editor*.—Sir,—As I am in the habit of transmitting and receiving parcels from Cheshire and Staffordshire, by railway, and as you are a true advocate for justice, it has induced me to take the liberty to address you for the purpose of asking a question respecting the responsibility of the two companies; for yesterday I sent a parcel to the Watford station, to be forwarded by railway into Staffordshire, and I sent money to pay the carriage and booking, as it was of value; but, to my great surprise, when the person returned he informed me that he could only secure the parcel to Birmingham! The London and Birmingham Railway Company have issued the following notice:—"The company are not responsible for any parcel above the value of £10, unless declared as such at the time of booking, and entered and paid for accordingly." No doubt the other company has issued the same notice. The question I wish to ask is, who is responsible after the parcel arrives at Birmingham? In my opinion it is not safe to send parcels by the railway, if that is the best arrangement that exists between the two companies, and the sooner that the directors of both companies give the subject their most serious consideration and attention the better.—I am, Sir, your most obedient servant, WM. GODWIN.

August 11, 1840.

RAILWAY ABUSES.—*To the Editor*.—Sir,—Can you give the public any information how it is that the directors of the London and Birmingham Railway charge 8s. per cwt. for silk goods sent from Coventry to London direct, while at the same time, if the goods were forwarded from Coventry to Birmingham by a common carrier, thence to London by railway, the charge would only be 3s. 3d., including every expense? We do not understand upon what principle they frame their scale of charges. It savors much of absurdity, if not of imposition, and is anything but fair to the people of Coventry. An evil like this ought not to exist, and we think will be best got rid of by your pointing public attention to it, which may be done by your publishing this, or in whatever way you may deem most advisable. Your obedient servants,

B. and T.

RAILWAY ACCIDENT.—On Wednesday last, a luggage train was proceeding on the North Midland Railway to Sheffield; on arriving near Staveley Forge, the axle of the second truck from the engine broke, which caused a considerable quantity of goods of various descriptions to be scattered about on the line, and destroyed. Several of the trucks were forced off the rails and considerably damaged. The amount of loss is stated to be from £500 to £1,000.—*Halifax Express.*

THE LATE FATAL ACCIDENT ON THE HULL AND SELBY RAILWAY.—ADDITIONAL PARTICULARS.—Hairbreadth escapes were numerous. One carriage which was overturned, contained sixteen persons, none of whom were seriously injured. The preservation of the lives of Mrs. and Miss Fletcher, the wife and daughter of the parish clerk of Howden, was considered miraculous. They were in the same carriage as Mr. Veltmann and Mr. Stead, and in conversation with the latter, when in an instant they felt themselves projected out of the carriage, and the next moment found themselves in the ditch, amongst mud and water, their bonnets being beaten to atoms, but their persons only slightly bruised. Mr. Smith Warmald, of Tickton Grange, near Beverley, who was alone in the fourth carriage, was projected through the window, and fell head foremost into the ditch; his hat was broken, and thrust completely over his face. On recovering himself a little, he perceived that one of the carriages was lying within six inches of his legs. He was slightly injured from the shaking, but not at all seriously hurt, and is now quite well. Mr. and Mrs. Robert Smith, of Carlton, near Selby, when the train was about to start from Selby, were going to step into the first carriage, when William Greaves, the guard, suggested that they would be as well a little farther from the engine (which is usually considered the safest); they then got into another, from which, when the carriages were in the act of falling over, they escaped by opening the door on the opposite side, Mr. Smith leaping out and pulling his wife after him. Mr. Kettle, of Birmingham, who was in the same carriage as Miss Lee, had his watch in his hand, and was telling her how many minutes they had been coming from Selby; next moment he found himself on the ground; he was stunned and bruised from his shoulder to the calf of his leg on one side, several buttons knocked off his coat, and his watch, the glass of which was broken, was still in his hand, while the individual to whom he had opened his mouth to speak was lying alongside of him, dead, and his own raiment saturated with blood. Mr. Craggs, we have been informed, was to have been married on the following Sunday.—*Leeds Mercury.*

PROPOSED NEW RAILWAY THROUGH CUMBERLAND.—A few weeks ago, we gave an account of the opening of the railway from Preston to Fleetwood, and we rejoice to learn that the directors of this undertaking propose carrying on the communication from Fleetwood to Peel, and from thence by an embankment across the Duddon into Cumberland. A preliminary meeting has been held to forward the objects, and from the wealth and influence of the parties who have taken it up, there is every prospect of the undertaking being carried out with promptness and energy. By an embankment on the Preston and Wyre Railway of one mile and a half, about 700 acres of land are gained; by an embankment of the same extent on the Duddon, 5,700 acres would be gained.—*Whitehaven Herald.*

RAILWAYS IN SCOTLAND.—The line of railway from Glasgow to Ayr is open to the public throughout, and a great increase to the amount of travellers and of business on the parts hitherto opened may be expected. From what little experience we have had in the benefits of railway travelling in this quarter it appears to come fully up, in the acceleration of trade and business, with any other district in the country where a railway has been laid down. On the Paisley fast day (last week), notwithstanding that the canal-boats were crowded to suffocation, and that the Paisley steamers, the Renfrew railway, and Clyde steamers had their full complement, nearly 4,000 passengers were carried on the line to Glasgow, and to accommodate the applicants, for one run, 19 carriages had to be set on. During the first 18 days that the Glasgow and Paisley line has been open, the number of passengers has been 2,018 per day, or in the course of the 18 days a total of 36,864, which is an average for each of the 24 runs per day of 85 passengers, and a fraction more. When it is recollected that the canal boats are only calculated to accommodate 70 passengers when full, and that the coaches were only licensed for 14 or 15 passengers, we thus find, that though the boats are still pretty well filled, the railway now conveys as many more passsengers as could have gone by both conveyances, though they had been crowded on every occasion. The most considerable portion of this increased trade has been the bringing of passengers to Paisley, which, during the time we refer to has been, we are certain, visited by two strangers for one that ever visited it before: it is a singular fact, that thousands and thousands of people who live within 20 miles of Paisley always regard it as only a large village, and it is quite amusing to hear the constant marks of surprise uttered by such strangers, when, by the railway, they find themselves unexpectedly landed in the centre of a busy population of from 60,000 to 70,000 persons.—*Renfrewshire Reformer.*

MILAN AND BERGAMO RAILWAY.—"Two locomotive engines," says a Milan letter, "made by Mr. Rennie, of London, have been tried with complete success on the railroad between Milan and Bergamo. Another engine, from the French manufactory of Creuzot, has arrived at Genoa, and another, from the factory of Mr. Cockerill, has been embarked at Antwerp. The directors of the road wish to try the merits of the different foreign engines. The road was to have been opened in June, but was delayed by disputes with some obstinate owners of land on the line, and other impediments. The opening will, however, take place by Saturday next."

RAILROAD ESTIMATES.

A small publication on the railways of England and Belgium has recently made its appearance, written by M. Auguste Perdonnet, professor at the Central School of Arts and Manufactures at Paris, and principal engineer of the Vorsailles and Paris railway, in which he endeavors to dispel the growing disinclination in France, since last year, to engage in similar speculations, and points out the cause of this feeling. He also, at the same time, enforces the necessity, as a matter of national concern, of establishing those means of communication through the kingdom. He has recently visited Belgium for the purpose of inspecting the railroads in that country, and he gives some particulars respecting the railroads in England, which, if not new, are at least worthy of being kept in mind.

"France," says M. Perdonnet, "has governed Europe by the power of her arms; she has governed and still governs by the power of her opinions; and yet France is, among civilised nations, one of those whose people are the most poor and ignorant, where the means of communication are in the worst condition, and where the great branches of industry are the most languishing.

"In France, the men who are placed at the head of the administration confine themselves to the high regions of politics, and disdain to look down upon questions concerning manufactures. It is because they know not how to calculate the extent of their influence. They could not have foreseen, but a short time since, that by the assistance of steam navigation they might have inflicted a terrible blow on England by the effectual establishment of a continental blockade; neither do they seem to be now aware that the establishment of great lines of railway is a far more certain and prompt means of consolidating the constitutional government, of moralising and enlightening the people, than electoral reform, or any other legislative reforms whatever. The time for discussion is past; that for acting has begun; we must at length either commence the work, or agree to abandon our metal manufactures, our large forges, our manufactures of machinery;—nay, more, we shall otherwise be obliged to renounce the idea of maintaining a powerful and active representative government, and to abandon our preponderating influence in Europe. The members of the legislative chambers, who are considered the most clever, and who possess the greatest influence, have shown the most inexplicable prejudices against railroads, and have expressed opinions against these new modes of conveyance, the incorrectness of which has been sufficiently demonstrated by experience."'

The persons who now entertain the greatest prejudices against railroads, are the same men who in 1838 were the most ardent advocates of them. Looking at the question superficially, they only judge from appearances, and take as the guide of their opinions the price of the shares, which are altogether independent of the real merit of the enterprises.

Nevertheless, it is observed, that the decline in the estimation of railways in France, as objects for investment of capital, arises from real causes, calculated to produce great discouragement. Among these causes the following are enumerated as the principal. First, the extreme levity with which the public engaged in these speculations, less for the

purpose of really employing their capital, than of speculating on the rise of shares, which has produced the effect of removing all other modes of estimating the value of these undertakings than the quotations on the Exchange. Secondly, the difficulty that has been experienced, in the existing depression of commercial enterprise in London, of paying up the deposits that became due on the shares, the influence of which has been felt in Paris. Thirdly, the extravagance with which the works have been executed; as for example the expenditure of 750,000 fr. on the London and Birmingham railway, for erecting a triumphal arch; an extravagance which has diminished the amount of the dividends, and increased the numerous miscalculations which have arisen on the execution of works otherwise most properly conducted. In the fourth place must be added, as a cause of discouragement to such speculations, the enormous difference between the estimates and the actual cost. On the railroad from Birmingham to Liverpool, the cost exceeded the estimate 90 per cent.; from Manchester to Bolton 100 per cent; from Liverpool to Manchester 200 per cent.; from London to Croydon 300 per cent., and on the Clarence railroad 400 per cent. In the same manner in France,—the estimate for the railroad from St. Etienne to Lyons was 9,000,000 fr., and there have been expended 15,000,000; for that of St. Germain, 3,900,000 fr., and there have been expended 12,000,000; in the railway on the right hand bank of the river to Versailles, the error in the estimate amounts to nearly 5,000,000. In the last place, one of the causes of the depreciation of railways is the impatience of the public, to whom the present is everything, the future nothing, and who do not consider that time is a necessary condition of success in all great enterprises, and that no system can be in full vigor until it is completed.

It is a fact, founded upon observation and actual calculation, that the railroads are at a premium on all points where they present a certain continuity of communication; and that the greater part of the shorter lines that cannot be profitably worked at present, will become valuable when they are connected with the general chains of communication of which they will constitute a part.

The want of experience in engineers and managers, is no doubt one of the causes of the differences between the estimates and actual expense. Nevertheless, it must be borne in mind, that railway undertakings are, from their very nature, liable to meet with serious obstacles, and present numerous and serious difficulties, which science has not been able to overcome. We will mention, for example, that in consequence of the competition and cupidity of the English, the Act of Parliament alone, for the railway from London to Bristol, cost 2,217,750 francs, and that from London to Birmingham, 1,821,700f. Next came the claims of the proprietors of lands, whose cupidity and exaggeration in estimating the value of their property knew no bounds. The estimate, approved by the government, for the railroad from Paris to Versailles on the left bank, stated the indemnity to the owners of property at 177,600 fr., and the company has paid 2,700,000 francs, which is nearly 1,500 per cent. above the estimated value.

M. Perdonnet observes, "Whatever care is taken in laying down the plans, and forming the estimates, and whatever method be adopted in carrying them into execution, it is very difficult, not to say impossible, to ascertain beforehand the amount of the cost of railways of any great extent." This opinion is confirmed by the following table of the cost, per league, of the principal railroads in different countries:—

	francs.
In the United States (average price)	250,000
Belgium ditto	500,000
St. Etienne to Lyons.....	1,000,000
Birmingham and Liverpool.....	1,500,000
Liverpool and Manchester	2,600,000
Paris and Versailles (right bank)..	3,500,000
London and Greenwich	5,300,000
London and Blackwall (according to the estimate of Mr. Stephenson).	12,000,000

SERIOUS ACCIDENT ON THE EASTERN COUNTIES RAILWAY.—An accident of a serious nature occurred on Wednesday evening, on the Eastern Counties Railway, which has unfortunately terminated in the death of one of the men employed upon the line, and in serious injury to several other persons. On the seven o'clock train leaving Brentwood with a considerable number of passengers, the engine-driver, when descending the inclined plane, which commences at Brentwood-hill, neglected to shut off the steam, agreeably to the repeated orders which had been issued to all the drivers in the company's service. The consequence was, the train descended with immense velocity, and when near Putwell's-bridge, began to rock in a fearful manner, and after running about 150 yards, the engine finally ran off the rails, dragging the carriages with it. One of the workmen engaged on the line was killed on the spot, and the engine driver and stoker were both very seriously injured, as well by the concussion as by the boiling water from the engine. Several of the passengers were more or less injured, one or two of them seriously, being burnt and scalded by the coke and water from the engine. The following are the names of the unfortunate persons who have suffered by the accident:—Killed—Eastman. Scalded and bruised—Foster, engine-driver. Ditto wounded in the head—Austin, fireman. Scalded, with concussion of brain—Mr. Ebsworth, passenger. Slightly wounded in face—Mr. H. Corbould.—Severely scalded—son of ditto. Concussion of brain, slight—Mr. Pierson. Bruised, not much hurt—son of Colonel Tyler. Bruised, not dangerously—Mr. Brown of Colchester. Scalded and bruised, ditto—Mr. Tozer.—Slightly wounded—Collar, the guard.

GRATUITOUS COPIES

of our Journal have been forwarded to a number of Individuals interested in some Patent, or Invention, of which notice has been taken in our number of to-day.

TO CORRESPONDENTS.

We shall, at all times, be ready to ANSWER QUESTIONS *that may be put to us, relative to any of the subjects indicated in our title; and questions put during the current week, will be replied to either the same, or following week.*

"THE INVENTORS' ADVOCATE, *and* JOURNAL OF INDUSTRY," *may be forwarded,* postage-free, *to all the undermentioned places:—*

Antigua	Demerara	Montserrat
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Berbice	Gibraltar	Nova Scotia
Bermuda	Greece	Quebec
Brazils	Grenada (New)	Spain *via* Cadiz
Bremen	Halifax	St. Domingo
Buenos Ayres	Hamburgh	St. Kitts
Canada	Heligoland	St. Lucia
Caraccas	Honduras	St. Vincent's
Carthagena	Ionian Isles	Tobago
Cephalonia	Jamaica	Tortola
Columbia	Lagunayra	Trinidad
Corfu	Malta	Zante
Cuxhaven		

It will be transmitted, upon payment of one penny, *to India, the Cape of Good Hope, and New South Wales.*

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"THE INVENTORS' ADVOCATE" *is published every* SATURDAY MORNING, *at* 7 O'CLOCK; *if, therefore, our Subscribers do not receive their copies* regularly *from their Newsmen, the fault never rests with us.*

For the convenience of persons residing in REMOTE PLACES, *the* "INVENTORS' ADVOCATE," *will be regularly issued in* MONTHLY PARTS, *stitched in a handsome wrapper.* PARTS 1 *to* 14, ARE NOW READY.

ADVERTISEMENTS *should be sent in not later than* Thursday Evening.

"Dr. S——r."—*We beg to decline this gentleman's favor. His papers are left out for him at the office of publication, 7, Twistock-street.*

"A. Cookson," Glasgow.—*The article appeared in our 24th number.*

"E. L."—*It will be due on the 29th instant.*

"J. P. W.," Manchester.—*The pamphlet has been received, and shall be noticed in our next.*

"Alfred."—*We have received a letter from a correspondent, signing himself* "Alfred," *in which an attack is made on the* "*College of Civil Engineers.*" *It is quite out of our province to interfere in matters of* private *feeling, and our correspondent must excuse our not inserting his communication.*

TO OUR SUBSCRIBERS.

TWO *numbers of the* "INVENTORS' ADVOCATE" *(Nos. 18 and 19) were published* July 1. *The former contains, in addition to the usual varied matter, the* TITLE PAGE *and* a Copious INDEX *to the* SECOND VOLUME.

VOLUME II. *of the* "INVENTORS' ADVOCATE," *handsomely bound, is* NOW READY. *A* FEW COPIES *of the* FIRST VOLUME *still remain on hand.*

TO INVENTORS.

ALL PERSONS who may be desirous of TAKING OUT PATENTS, or of bringing VALUABLE INVENTIONS into USE, are requested to APPLY to the PROPRIETORS of "THE INVENTORS' ADVOCATE," (DELIANSON CLARK & CO.) at their "PATENT AGENCY OFFICE FOR ALL COUNTRIES," 39, CHANCERY LANE, where they may be consulted, daily, relative to the PATENT LAWS of GREAT BRITAIN, and ALL OTHER STATES.—(See ADVERTISEMENT on the last page of the present Number.)

THE

INVENTORS' ADVOCATE,

AND

JOURNAL OF INDUSTRY.

SATURDAY, AUGUST 22, 1840.

It seems probable, from the warlike threatenings and preparations of France, that at an earlier period than we anticipated, when we penned our recent articles on war steam-ships, the efficacy of that new element in naval warfare may be tested. France is making great efforts to bring a large naval force into action in the least possible time, and we perceive, from a statement of the naval resources of that country, that she at present possesses twenty-nine steam-vessels, which are classed as ships of war. Of these, however, not one exceeds 220 horses power, and only three are of that magnitude, the majority of them being of only 160 horses power. There are, however, on the stocks, three large-sized steam-ships, each of 450 horses power, which will require many months to fit them for sea.

The war steam-ships are each armed with six cannon. The French possess, however, in addition to the above, ten steam post-office packets, that are capable of being fitted as ships of war.

It appears from this statement, that France is at present much behind England in the amount of steam-power applicable for naval warfare, and if we were to be engaged in hostilities with that country at the present time, the great superiority we should possess, in this respect, would give us an advantage over the naval armaments of France, for which the superior preparations of that country, in respect to ordinary ships of war, would afford a very inadequate compensation. In regular naval engagements, the employment of steam tugs might serve, in a great measure, to remove the disadvantage under which the common line of battle ships would otherwise enter an action; but in single engagements, in chasing, in cutting out ships from a harbor, as guard ships, and in making descents on the coasts, the steam ships of war will possess immense advantages.

In this week's number of our Journal, we have given two separate articles, translated from different sources, in each of which the unprepared state of France, to compete in warfare with countries that have paid more attention to improvements in mechanical science, is strongly dwelt upon. The government of that country, like that of our own, has given little encouragement to improvements in mechanical science, ignorantly imagining that such matters are beneath attention, and that they cannot have any bearing on the political interests of the nation. In this notion, however, they are egregiously mistaken, for, independently of the great national advantages attending improvements in the arts and manufactures in time of peace, the progress of science is calculated to produce a complete revolution in the art of war; and the fate of nations may thus depend on the improvements and inventions of ingenious mechanicians. It is not to the encouragement offered by our government for mechanical inventions, and discoveries in sciences, that the more advanced state of this country is to be ascribed, but solely to the superior spirit of activity and enterprise, combined with inventive genius, which characterises the people, and which has forced the government to adopt the improvements that have been made without its encouragement.

There is an outcry now raised in some quarters, against our government, for not having placed our naval armaments in a more effective condition; but we feel persuaded, that the fleet of steamers this country could muster and equip, within a very short space of time, would be more than adequate to compete with the combined navies of Europe. It is thus that the progress of science and mechanical genius adds to the strength of empires; not alone by conferring wealth and prosperity in time of peace, but by affording new means of defence and attack in time of war.

VELOCITY AND POWER.

There is no question in mechanical science that has given rise to so much debate as the relations between power and velocity. It is this question that produced the long discussions between Leibnitz and Descartes, and their followers, and in which each disputant seemed to be right or wrong according to the different forms in which their respective arguments were stated. The curiosity of the dispute is, that facts can be adduced on each side, that appear fully to support the two opposite views of the question. For instance, it was maintained by Descartes and his followers, and it is a generally admitted law of mechanical science at the present day, that as a double power produces a double velocity, therefore, a body moving with double velocity possesses only a double momentum. It would scarcely seem to require much argument to establish a position, apparently so self-evident. As an illustration of its truth, however, it may be stated, that if a ball of one ounce weight strike against another ball of the same weight, the two balls will move after the impact with half the velocity of the single ball; the momentum of the two balls being still the same as that of the single one before impact. If the velocity be doubled, the velocity of the two balls after striking will only be equal to that of the single ball in the first instance, which shows that the double velocity acts only with double power. Again, if one ball, weighing two ounces, and moving with a velocity of ten feet in a second, strike against another ball of half the weight moving in an opposite direction with the velocity of twenty feet in a second, the effect of the collision will be to destroy the motion of each; showing, most clearly, that the momentum of a moving body is increased in direct proportion to the increased velocity.

Leibnitz, and his followers, however, asserted, that the force of a moving body is proportional to the *square* of its velocity, and not in direct proportion to the increased speed. In support of this opinion, they adduce the facts that a body which is propelled with double velocity rises four times as high in the air, against the force of gravitation; that it penetrates four times as deep into a mass of clay; that it bends a spring four times as strong to the same degree; besides a number of other instances, which appear fully to bear out the notion that a double velocity is accompanied with a quadrupled force.

We have never seen any clear popular explanation of the causes of these different results, which appear to be so contradictory; and the unsettled state in which this question remains, has given rise to many errors and false calculations, which have led not unfrequently to serious inconveniences, and even to the ruin of projectors, who have been misled by the idea that double velocity produces a quadruple power. It is important, therefore, that these apparent incongruities should be clearly explained. In attempting to do so, we shall have to advance one or two propositions which may probably be new in their mode of application, but on the correctness of which, we think, when duly considered, no doubt can be entertained. The prosecution of these views may lead to some important results in mechanical science; for the present, however, we shall content ourselves with explaining the cause why a body moving with a double velocity rises in the air four times as high, in opposition to the attraction of gravitation, as when the velocity is only one half.

The great error into which Leibnitz fell, was in assuming the *space* through which the retarding force of gravitation is exerted as the measure of its resistance, instead of the *time* of its operation. Thus, where the same body was propelled, perpendicularly, against the action of gravity, at one time to a height of 100 feet, and at another to a height of 400 feet, it was assumed that the force which could propel the body four times the distance, must be four times as great. The action of gravitation itself might, however, if properly considered, have raised a doubt as to the correctness of that reasoning; for it is known that a falling body moves in two seconds through four times the space which it does in one, and yet the force acting upon the body is uniformly the same. It does not seem, however, to have occurred to Lebnitz, nor even to his opponents, to examine whether, in

point of fact, the height to which a body can rise against the force of gravitation, or be propelled against any other uniformly acting resistance, be a correct measure of the momentum of the moving body.

We think it may very clearly be shown that it is not, and that the true measure of the quantity of attracting or retarding power of gravitation, is to be found only in the *time of its action*, and not in the space through which a body is moved by the operation of that power.

The force of gravitation has a known intensity, which has a reference, like all other forces, to the time of action. For instance, its uninterrupted effort for one second will propel a body through a space of 16 feet, and at the end of the fall the body will have acquired a velocity of 32 feet in a second. The average velocity communicated by the attracting power is 16 feet in a second. That also must be taken as the amount of the retarding force of gravitation, whatever be the size of the moving mass, or the velocity with which it moves. The apparent effect of the retarding power of gravitation, is therefore comparatively much less on bodies rising with a rapid motion, than on bodies moving slowly. Thus, a ball propelled perpendicularly, with a velocity of 32 feet in a second, would be brought to rest when it had attained the height of 16 feet; because 16 feet in a second being the measure of the attracting force of gravitation, constantly acting against the upward motion, that quantity, deducted from the initial velocity of 32, would leave 16, as the distance to which the ball would be propelled before the retarding power of gravity would counteract the propelling force. If the ball be propelled at the rate of 64 feet in a second, the effect of the retarding power will be comparatively less, for whilst it remains constant at the rate of 16 feet in a second, the velocity against which it acts is doubled; therefore, though the ball will be brought to rest in two seconds of time, the space it will traverse will be quadruple, on account of the additional velocity. For instance, in the first second the ball would ascend to a height of 64 feet, less 16; that is, to 48 feet. During that time, however, the retarding force acts at every part of the ball's path in diminishing its velocity, so that, by the end of the first second, its velocity will be diminished 32 feet in a second; that being the final velocity gained by a falling body, at the end of one second by the impulse of gravitation. In the next second of time, therefore, the ball would commence its upward course with a reduced velocity of 32 feet, and the retarding power of gravitation would then, as in the first instance, bring it to rest when it had risen 16 feet; making the total height 64 feet.

When we estimate the retarding force of the attraction of gravitation by the time of its action, and not by the space traversed, we thus perceive that the apparent incongruity subsisting between velocity and power disappears. The space through which a body is propelled against the force of gravitation, it will be thus observed, cannot be taken as a measure of the propelling power. The same principle may be applied to the penetration of yielding substances; but this question must be left for subsequent consideration.

NEW INVENTIONS.

PATENT WIRE ROPE.

It has been our desire to enter more fully into the merits of this patent than we had space on a former occasion, when directing attention to its applicability, both with regard to economy and security for our mines, but we have not yet been in a situation to afford a notice so satisfactorily as we could wish, the information we contemplated receiving not having come to hand. In its absence, we have only to note the additional trial made at the Chain Cable Proof House, at Withymoor, near Dudley, on the 25th ult., of which the following is a copy of the certificate signed by Mr. Lewis, the proprietor of the machine:—

Description.	Size.	Bore without Breaking.	Broke at	Second Breaking.	Third Breaking.	Weight per Fathom.
	Inches.	Tons.	Tons.	Tons.	Tons.	lbs. oz.
Flat.....	4 by ½	11	11½	6	3	7 6
,, ...	3½ by ⅜	7	7½	4	1	4 15
,, ...	3 by 3-16	2	2½	2	..	2 5
Round	3-inch.	16½	17	8	3	7 0
,, ...	2½ inch.	12	13	5	2	5 13
,, ...	1¾ inch	6½	7	4	1	2 13

From this it will be seen that, in addition to the strength of tension employed previous to breaking, instead of, as in the case of cable or hempen rope, breaking short, it required three separate strains to break it entirely. We have been favored with a letter from a friend in the north who has just received a specimen, and who promises to advise us the results of trial to which he intends to submit it. Specimens of the various descriptions may be seen at the Polytechnic Institution, Regent-street, and at the Adelaide Gallery, as also at our office. The increasing demand for the article, and the test it has borne of some years' trial by the Admiralty, is the best report upon, and evidence of, its superiority. We should think it peculiarly well adapted for the London and Blackwall Railway, where, we understand, the rope has snapped some half-dozen times. The size of the rope used there is, we believe, 6½ in, and the cost of a single rope, £1,250.—*Mining Journal.*

NEW MUSKET FOR THE BRITISH ARMY.

The Master-General of the Ordnance recently issued instructions, that two muskets on an entire new principle, which had been submitted to him by Mr. Wilkinson, a London manufacturer, should have a fair trial. The muskets were accordingly forwarded to Woolwich, and placed in the charge of an intelligent corporal, with orders that 1,000 rounds of ball cartridges should be fired from each, for the purpose of testing their capabilities and ascertaining their good or bad qualities. The corporal selected two experienced gunners, and the men have attended every day at the butt in the Royal Arsenal to practise with them. Upwards of 800 rounds have been fired from each of the muskets, and the ease, rapidity, and precision with which they can be used, has afforded the greatest satisfaction and even surprise, on account of the simplicity of their construction. The barrel of this musket is of the same length and thickness as those used by the soldiers of the line at present; the touch-hole, instead of being placed at the side, is under the stock, immediately in front of the trigger, which is secured from the possibility of discharging the musket by accident, even under the most careless circumstances. Instead of flints, percussion caps are used, and the force necessary to ignite them is effected by a steel spring about seven inches in length, and so simple, that it can scarcely ever get out of order. Owing to the construction of the locks of the present muskets, the stock is much weakened by having to cut out a portion for their reception, and 20 screws are required to fix the various parts to each other, and to the barrel. By Mr. Wilkinson's plan, which he has secured by patent, five screws only are required, and there is no cutting requisite for adjusting it to the stock and barrel. This improvement makes the musket a pound lighter, and will be of immense advantage, not only to the army, but also to sportsmen and every person who has occasion to use fire-arms, as the percussion cap being discharged under the stock, the motion cannot be seen by the eye, which renders it peculiarly safe for that organ, and secures the certainty of a good aim, and this is greatly assisted by an elevation at the breach of the barrel, about half an inch in height, formed like the Roman letter V. and similar to those used on the large guns of the Ordnance department.

NEW ENGINE OF WAR.

M. Billot has invented a machine which discharges 2,000 balls, of half a pound each, every minute, or 120,000 per hour without cessation. Its action may be continued or arrested at the will of the party in charge of it. The discharge takes place at four different points, and may be directed at as many objects, or united against one. The machine weighs about 85lbs., and its range is about 3,280 feet; but, if one were constructed of 1½ cwt., its range would be quadrupled. The use of the machine does not depend upon gunpowder, air, or steam, as a motive power.

THE ATMOSPHERIC RAILROAD.

We have received a letter on the subject of what was said in a notice on the atmospheric railroad, which appeared in our columns a few days ago. It is from a Mr. Pinkus, who complains of the conduct of the patentees of the plan laid down

across Wormwood Scrubbs, and affirms that our account of his (Mr. Pinkus's) invention was incorrect. With respect to any charge he may have against the patentees of the railroad at Wormwood Scrubbs, we shall decline giving any opinion. His redress against them is in a court of law, and not in the columns of our paper. With regard to our imputed mis-statement, if we be incorrect we are sorry for it, and have no objection to publish that part of the letter which sets forth Mr. Pinkus's own account of his invention. It is as follows:—"My valve upon these mains is constructed in the following manner, as one of the several methods to suit varied applications: metallic plates combined with flexible material rivetted together, or fastened down on one side of the valve aperture, and made to close it air tight by one edge falling into a nick, in which is placed a composition to seal the valve, which opens and closes with the action of a hinge: an expanding piston moving in close contact with the interior of the main is suspended from an outer carriage by an inflexible metal arm, or bar, which passes through the valve aperture, lifting the valve so as to admit the external air, immediately behind the piston, without which there would be a re-action and loss of power; the piston must be in advance of the aperture, and can be placed in no other position; a wheel rolls on the valve between the piston and the valve aperture, to prevent the valve rising before the piston, which would otherwise let in the external air before it, and destroy the power; another wheel rolls behind the projecting arm to force down the edge of the valve into the cemented nich, without which the section of main could not be made air-tight, and there would be no power to move another train. These are some of the combinations, without which the principle cannot be applied."—*Times* of Thursday.—[We have been requested to state that Clegg's patent was dated 3d of *January*, 1839, and that the date of Mr. Pinkus's patent is the 20th of *August*, 1839.—*Times* of yesterday.]

WOOD PAVEMENTS.

We willingly give insertion to the following communication from a correspondent, who is a warm partisan of Mr. Stead's system of wood paving. Following up the system of strict impartiality, which we have made the undeviating rule of our Journal, we conceive it to be our duty to open our columns to Inventors, that they may plead their own cause. In justice to Mr. Stead, we are bound to add, that we have ourselves investigated the facts on which our correspondent's statement is founded, and that we can vouch for its truth:—

"The superiority of wood pavements over those of stone, is now so generally admitted, by all who have had opportunities of comparing them, that the question as to the best and most economical mode of constructing thoroughfares of the first-named material, is one of great interest and importance. We have not been inattentive observers of the various experiments which have been made in London; we have carefully perused the controversied articles which have appeared on the subject in some periodicals, and we have endeavored to obtain information on the subject from the best sources within our reach. The result of our inquiries, and of our observation, we now propose to lay before our readers; and we feel assured that the same reasons which have determined us to prefer the system of Mr. Stead, will secure to that gentleman's invention the favor of the impartial part of the public. We have, at least, the satisfaction of knowing that our opinion is in accordance with that of many of the most eminent engineers of the day.

The immense saving in the expense of paving upon Stead's principle, is of itself a circumstance which must recommend that method to general adoption. It is true, the mere fact that it will cost less, does not determine its merits; because there might be defects in the system, which would more than counterbalance the advantage of cheapness. But of two plans, supposed to be in other respects equally good, there cannot be a doubt that the one which will cost the least, ought to be selected. If, then, we claim for Stead's patent no higher merit than an equality, as regards its utility, to a rival system, we claim for it a preference on the ground of its cheapness alone. The difference between the cost of the hexagon pavement of Mr. Stead, and that of the Metropolitan Company, is very striking, being not less than 40 per cent. But it would be unjust to Mr. Stead, to leave it to be inferred that the superiority of his system consists only in its cheapness. It possesses several very important advantages over all other plans. It is more easily repaired, and at a far less cost, and it is more easily removed when drains are to be opened, and when water or gas pipes are to be laid or repaired. Most of our readers are, doubtless, aware that a specimen of hexagon pavement was laid down in Oxford Street towards the close of 1838. Specimens have since been laid down in the Strand, at the Old Bailey, and other places. To the first of these, the Patentee might with perfect confidence refer, as a proof of the excellence of his system. Though placed under all the disadvantages of inexperience on the part of workmen, and of other drawbacks, that specimen continues to be the admiration of all who see it, without perceptible decay, and without shrinking; the only instances of unevenness on the surface, being where blocks had been taken up by order of the surveyors of the district, for the purpose of ascertaining the condition of the wood, which was found to be perfectly sound: a circumstance which shows that there is no reason to fear the decay of pavements of this material. It has been alleged by parties evidently interested in the success of the Count de Lisle's patent, that Mr. Stead's pavement in the Strand is a failure. This statement is entirely void of foundation. We have seen a certificate, dated the 23d July, by the clerk of the committee for paving, in which it is stated, that "the hexagon wood block carriage pavement of Mr. Stead, and by him laid down in the Strand, *answers well*, and that it has not shifted, that it was opened on the first of June of the present year without its having been back rammed for a trial; that on the 15th June it was back rammed, that the surface is *perfectly level*, and has not required any reparation whatever to the present day, and that it fully answers the expectation formed of it."

The enemies of Mr. Stead speak also of mischances in the Old Bailey and St. Giles's, but these are easily accounted for, and their cause being known, similar ones cannot occur again.

That at the Old Bailey, was caused by the circumstance of the wood having been too long seasoned; and when swelled by the rain, some of the blocks were forced up. Since it was relaid, it has remained perfectly firm and even. The pavement in St. Giles's was not laid by Mr. Stead; and yet we have been credibly informed, that the person who laid it has had the extraordinary assurance to mention the result of his own bungling as an argument against the use of Stead's system! The advocates of the Metropolitan Company contend that it would be wiser to spend 12s. or 13s. per yard upon their pavement, than 8s. or 9s. upon that of Mr. Stead. But, it must not be forgotten that their first experiment in paving was an absolute failure. The splendid pavement which was laid at Whitehall in December last, was broken to pieces before it had been open 24 hours! True, the second pavement has been more fortunate hitherto; but the weather since it was opened has favored it in a remarkable manner, and before the public will be able to judge of its real value it must be exposed to the influence of such weather as that which Mr. Stead's pavement in Oxford Street has had to contend with—such a severe frost as that of the winter of 1838, and such rains as those of last winter. Of the principle of the Metropolitan system, we shall content ourselves to speak in the words of an eminent engineer, Col. Jackson. In an article in the Polytechnic Journal of February last, speaking of the pavement at Whitehall, he says, "every single principle peculiar to a good wood pavement is neglected; and what is worse, the most simple and evident principle of mechanics violated!" Yet this is the system which the Metropolitan Company are endeavoring to establish to the exclusion of Mr. Stead's! that system of which the same eminent engineer has said, that "it is the only good one, for it is the only one in which true principles are adhered to—principles which cannot be violated without a sacrifice of some one or other of the advantages, without which a wood pavement is worse than our present stone paving." The peculiarity of the Metropolitan system, upon which its advocates seem chiefly to rely, is the circumstance of the blocks being joined together by means of dowells. Now there is nothing to prevent the use of dowels in hexagon pavements; but they have been found worse than useless. At St. Petersburg, where they were formerly used, they have been discontinued, because it has been found they were unable to resist the pressure occasioned by the swelling of the wood in wet weather, or the breaking up of frost. What we have said already, must, we think, convince the impartial reader that it is not without reason that we prefer the hexagonal pavement of Mr. Stead, to that of the Metropolitan Company. We perceive, too, that similar opinions prevail in the provinces, for in a Manchester paper of Saturday last, we read that Mr. Stead has concluded contracts with the surveyors of that town, and those of Salford, and we happen to know that he is also in negotiation with the authorities of Leeds, with every prospect of forming large contracts for that town. We shall probably return to the subject in a future article; what we have said, will, we trust, in the mean time, serve to counteract the endeavors of the enemies of Mr. Stead, to deprive him of the fruits of his labor, enterprise, and skill."

VARIETIES.

Imaginary Sympathy between the Pulse and the Hour of the Day.—In a former number, we copied avowedly from the *Sun* newspaper, a short paragraph, signed "Secretarius," on this subject, but offered no comment of our own at the time. In our paper of the week following, however, the fallacy of such a principle was clearly pointed out. The *Liverpool Mercury* informs us, that the same idea prevailed, and that the same subject was discussed, in 1823. This we were aware of; nay, we remember ourselves experimenting with a shilling and a piece of silk, suspended from our thumb into a tumbler, more than twenty-five years since. In some instances, the experiment was successful; in others, not. The principle was therefore evidently unsound. We are rather surprised to see our Contemporary so very wrath upon the subject, and devoting so large a portion of his columns to "breaking a butterfly upon a wheel." It would appear that "Secretarius," the correspondent who furnished the paragraph to the *Sun* newspaper, is a personal enemy of the Editor of the *Liverpool Mercury*, for he pursues him even "to the death," and then laments that the "Editor of that intelligent scientific Miscellany, the *Inventors' Advocate*," should have given insertion to the "tale." Now, we can have no possible objection to the war being carried on against Mr. "Secretarius;" but why, we ask, should WE be lugged in, by name, to see the punishment administered? We ask the question, pointedly, as, by our worthy Contemporary's own avowal, the London and Provincial papers, generally, have copied the detested paragraph.

Fossil Fishes and Scales.—M. Atmuss has discovered an extensive deposit of fossil fishes and scales in Livonia, hitherto undescribed. The form and dimensions of many of them, are very extraordinary. The Academy of St. Petersburg have resolved to be at the expense of publishing a description of them.

Animalcular Constitution of Chalk.—Professor Ehrenberg, in 1836, announced, that in examining chalk and other calcareous rocks, he had discovered the characteristic fact, that the smallest grains of chalk appeared to consist of regular elliptical particles, possessing a crystalline aspect. Since that period, he has ascertained that the chalk of

Puskaresz, in the east of Prussia, and that of the island of Rugen, of Schouen, Denmark, Gravesend, Brighton, Ireland, Mendon near Paris, Girgenti in Sicily, presents two different structures; the one inorganic, distinguished by its regular elliptical structure and granular slaty disposition, and the other organic, consisting of microscopical shells. By mixing Canada balsam, by the assistance of heat, with the dry chalk, in a fine state of division, Ehrenberg found that the chalk contained an immense number of microscopical animalculæ hitherto unknown, varying in size from one twenty-fourth to one two-hundred and eighty-eighth part of a line. A cubic inch possessed upwards of a million of them; consequently, a pound weight of chalk contains above 10,000,000 of these animalculæ.

Steam-Ship, India.—This magnificent vessel, of 1,206 tons measurement, is now being fitted for the voyage out to Calcutta, and will leave England on the 15th of next month. It is expected that she will take up the line from Calcutta to Suez in January, and that she will perform four voyages between those ports in 1841, touching at Madras and Ceylon on her way. In 1842, the company, of which Mr. Curtis is chairman, will have vessels of 2,000 tons and 600-horses power to run between Calcutta and Sucz, and the same class vessels between London and Alexandria, to form one continuous chain from London to Calcutta.

Mr. Charles Green, the Aeronaut.—Mr. Green has just received permission of the mayor and corporation of the city of Norwich, to exhibit his great Nassau balloon in Saint Mary's Hall of that city, to which place Mr. Green will proceed in a few days. It is intended to inflate the balloon in the first instance with atmospheric air, and afterwards to make some private ascents. Mr. Crawshaw and other scientific gentlemen will accompany the aeronaut.—*Herald.*

[Mr. Green in his ascent on Monday, from Cremorne House, had a very narrow escape with his life. During his descent at Rainham, in Essex, he was hurried along by the wind at the rate of 60 miles an hour, and he has received internal injuries which we fear will confine him to *terra firma* for some time to come.]

The Sacred College at Rome has had submitted to its consideration, the question whether it be lawful according to the Church of Rome, for penitents to submit to the operations of magnetism. The Sacred College of Cardinals, after maturely deliberating and consulting the works of the ancient fathers of the Church on so knotty a point (from whom it may be conceived they would not derive much enlightenment on such a question), at length arrived at the following decision, that "all heresy, witchcraft, invocation of the devil, either direct or indirect, being renounced, the simple act of employing medical remedies, otherwise permitted, is not morally prohibited, provided it has no tendency to an illegal or bad purpose of any kind."

Junction of the Atlantic with the Pacific Ocean.—A Dutch royal commission (we are informed by *L'Echo du Monde Savant*) has ascertained that the river San Juan, and the lake of Nicaragua, may be easily rendered navigable for large vessels, and a ship-canal carried from the lake to the nearest point of the Pacific Ocean (a distance of 5½ leagues) so as to connect it with Carribean Sea. The canal, for a certain distance, should be conducted by a tunnel, through a hill elevated 487 English feet above the level of the lake. The elevation of the lake above the level of the Pacific is only 128 feet, so that numerous locks would not be necessary. A communication between the two oceans might also be effected by connecting the lake of Managua with the Pacific; but a canal of 13 leagues with numerous locks would be required, and consequently the expense would be greater. This portion of America is very thinly peopled, and therefore it cannot be expected that this work will be executed unless it be undertaken by European (probably by English) capitalists. Many projects have been brought to a successful issue within the last few years, notwithstanding difficulties of greater magnitude. The toll paid upon such a line of communication (even if we calculated according to the existing trade between Europe and the western coast of South and North America) would be of large amount; but there can be no doubt that commerce would be very much increased by opening so easy an access to Europe.

The Mining Population.—It is with much gratification we learn, on good authority, that the situation of the mining population has attracted the attention of the promoters of the Agricultural and General Life Assurance Company, who are now collecting data upon which to found a set of tables—adapting the principles of life assurance to the habits and necessities of that class. We believe the plan is nearly matured.—*Mining Journal.*

Proposed means of providing an immediate supply of water, in case of fire.—A deputation waited on the Marquis of Normanby, by appointment, on Friday, the 14th instant, at the Home-office, consisting of the two members of the borough of Southwark, Messrs. Humphrey and Wood, and Messrs. J. Curling, T. Day, J. Sterry, Burford, and Elliss, to lay before his Lordship the models and plans introduced by Mr. John Keyse. They consist of means for providing an immediate supply of water in all cases of fire, with other important additions for this extensive metropolis, and other parts of the kingdom. The simple and scientific arrangements were highly approved of by his Lordship and the gentlemen present, and reflect great credit on the inventor, Mr. Keyse. It is believed that the Government will immediately take measures for the adoption of the plans proposed; and it is earnestly hoped, for the sake of humanity, that no time may be lost in carrying into effect so important a measure.—*Times.*

Inventive "Notions."—We have, just at the moment of our going to press, had a sheet of printed paper put into our hands, sufficiently large to make a comfortable cloak for two stout men. It is a *Newspaper*, of American manufacture, and is entitled the "*Boston Notion.*" It is of such gigantic proportions, that it requires to be folded and refolded several times, before the eye can be brought to a proper focus. To peruse it entirely, would occupy a full week; and to digest the variety of its contents is more than we or any other sane individual would undertake to do in double that time. Could our space admit of it, the Editor's leading article would form a rich morceau. We regret we cannot print it; but a short extract we must give. It is the Editor's final remarks:—"We sum up," he says, "by stating the amount of printed matter we furnish for 12 1-2 cents. This sheet contains 490,800 printers' *ems*, and by using smaller type than we have before done, we now give more than ever we did, and *more than was ever printed upon any one sheet since* FAUST *invented the art, four hundred years ago.* The leading matter now offered in every form and variety, is equal to 500 pages of ordinary novels. Two volumes, larger than most of the volumes of Scott's novels, for nine-pence! and made up, too, from the best writings of the most favorite *literati* of both continents." It is even so; and with pleasure we record the "birth" of so prodigious an "invention", in our pages. We need only add, to give a fair idea of the size of the sheet, that we have spread it on a dining-table, calculated to accommodate, comfortably, twelve persons,—it covers the said table admirably. By the way, it might, at any time, should occasion require it, be used as an 'out-size' *table-cloth.*

Seizure of the Steam-ship "British Queen" by Her Majesty's Board of Customs for Smuggling.—A good deal of excitement was caused on Thursday, in the commercial world and on the river, owing to a report being extensively circulated to the effect that the Transatlantic steam-ship, the British Queen, at present moored at Blackwall, had been seized by the commissioners of customs, in consequence of a large quantity of contraband tea, cigars, and tobacco being found concealed on board; and from diligent inquires made, the rumor turns out to be well-founded. The British Queen arrived in the river from Portsmouth between the hours of four and five o'clock last Sunday afternoon, and was moored in her usual position, nearly opposite the Brunswick-wharf at Blackwall. As soon as her mooring was completed, Richard Keefe, a custom-house officer, and Giles, a tide surveyor, went on board to inspect her cargo and her passengers' luggage, and take charge of the ship. The passengers having disembarked, and the greater part of their luggage being conveyed on shore, Giles and Keefe proceeded to search the vessel, and soon afterwards found a whole cask buried amongst the coals. They extricated it with considerable difficulty, and stove the head in, and found it to contain American manufactured tobacco, commonly termed "negro-head," the duty upon which, in common with all other foreign manufactured tobacco, is 9s. per pound, on being imported into this country. The officers prosecuted their search, and found a further quantity of tobacco in the leaf, also 19 lbs. 8 ozs. of tea. These articles were conveyed to the Queen's warehouse, at the Custom-house, on the following morning, and information of the circumstance given to the Board of Commissioners, who issued orders for the officers to rigidly examine the ship. Acting upon these directions, they continued their search, and in various parts of the vessel, but especially in the engine-room, amongst the machinery and under the coals, they discovered a vast quantity more tobacco, and 20 lbs. 4 ozs. of cigars. The quantity of tobacco seized altogether is rather more than 700 lbs. out of which 84 lbs. are in the leaf, and the rest of American manufacture, subject to a duty of 9s. per lb. The amount of the duty payable upon all the goods seized, amounts to between £300 and £400.

The articles found by Giles and Keefe on their second examination, were taken to the Custom-house on Wednesday, and the commissioners immediately gave orders that the steam-ship should be seized in the Queen's name, and several officers were sent on board to take charge of her. The British Queen is still under seizure, and will continue so until the affair is formally brought before the Board of Customs, who will mulct the company in such an amount of penalty as they may consider the circumstances warrant. —*Morning Herald* of yesterday.

Steam versus Steam.—The voyage of the British Queen to New York, and of the Britannia to Boston, has been regarded, by what may be called "the steam world," as a trial of speed. If we assume the difference between Liverpool and Boston and Portsmouth and New York at 32 hours, and strike off 8 for the detention of the latter at Halifax, the advantage is in favor of the latter steamer by at least one whole day.—*Times.*

Natural Gas.—There is now a project on foot for lighting Newcastle and Gateshead—the Newcastle and Shields, Railway—the towns of North and South Shields, Sunderland, and the Wearmouths—by means of the natural supply of gas at Wallsend! This gas, as all persons in these pits are well aware, has long been burned at the pit-mouth; man having wastefully refused to profit by the boon of which nature made him the offer. Some time ago, however, a Mr. Doaglas took out a patent for the useful application of these natural supplies of gas; and, more recently, he obtained a lease of the copious (we believe we may say inexhaustible) supply of Wallsend. His proposal to apply this gas to public purposes, has for some months been under the consideration of many influential and enterprising gentlemen in Newcastle, who seem to be sanguine in their expectations of success and profit in this singular speculation. The gas, except that it is diluted with about ten per cent. of atmospheric air (an evil which is not without a remedy), is remarkably pure—much purer, we are assured, than the gas now consumed in Newcastle and Gateshead, being free from the offensive admixture which occasionally makes itself too familiar with one of the five senses. The facilities afforded by the railways which line the Tyne on both its banks, for the laying down of pipes to convey the gas to the towns at the *termini*, will be at once obvious to every one; while it will be seen with what readiness the railways themselves may be lighted.—*Gateshead Observer.*

Draining the Haarlem Lake.—In the accounts recently received from Amsterdam, are given some interesting particulars of the means which it is proposed to adopt in the gigantic undertaking for drying the lake of Haarlem. M. Dietz, a celebrated Dutch engineer, has invented a machine which it is supposed will be adopted for this purpose, and by means of which he calculates that 100,000 cubic ells of water may be drained off daily. This ingenious person estimates the body of water contained in the Haarlem Sea at 770 millions of cubic feet, to empty which, it would require ten of his machines of thirty horses power each, the quantity drained off by them daily being one million of cubic feet, thus making the period required for its entire removal 800 days. The estimated expenditure of this work, second only in grandeur and importance to the Thames Tunnel, is as follows:—

	Florins.
10 machines at 30 florins for each	300,000
Coals, &c., 500 florins per diem for 800 days	400,000
60 workmen at 1½ florins each per diem for 800 days	72,000
Superintendence Plans, &c., &c.	25,000
Total	797,000
About	£66,416

Cure for the Tooth-ache.—At a meeting of the London Medical Society, Dr. Blake stated, that he was able to cure the most desperate cases of tooth-ache (unless the disease was connected with rheumatism) by the application of the following remedy to the decayed tooth:—*Alum reduced to an impalpable powder, two drachms; nitrous spirit of æther, seven drachms. Mix and apply them to the tooth.*—

I am convinced that many attendants at funerals, conducted under such circumstances, pay a fearful tax in the depreciation of their health, the almost inevitable result of their exposure to the exhalations of the dead. If these persons could be tracked to their homes, very frequently disease would be found the result of exposure to a "malaria," whose dangerous effects, in this country at least, seem neither to be understood nor appreciated.—*Gatherings from Grave-yards.*

Discoveries in America.—It is with no small degree of pleasure, we announce to the public that those distinguished American travellers, Messrs. Stephens and Catherwood, the former, well-known throughout this Republic, as the Chargé d'Affaires of the United States to Central America, and who, during a residence of six months has by his urbanity and gentlemanly deportment, won the confidence and esteem of every citizen of Central America, have recently made a visit to the ruins which exist in Quirigua, and intended also to visit Quichey, and then to pass to the ruins of Palenque, in the province of Chiapas, in Mexico. The following are their discoveries made in Quirigua:—One statue 10 feet high, lying upon the ground. One ditto 40½ feet high, lying upon the ground, face looking towards the heavens. One ditto 26 feet high, inclining similar to the steeple or tower at Pisa. A monument 23 feet high, perpendicular, in the form of an obelisk, full of hieroglyphics, with a human statue cut upon its top, and has some figures in its hands. Another statue, nine feet high, representing a woman. One other statue nineteen feet high, representing on one side the figure of a woman, on the other a man, in good preservation. Another, the head of a giant six feet in diameter. Two altars most elegantly sculptured. One obelisk, twelve feet in height. Four other monuments in distinct places, one of which is of a circular form, and upon a small eminence formed of stones, apparently brought from the river. In the centre between these four monuments, there is a huge round stone, which is wholly covered with hieroglyphics and inscriptions; beneath the stone are two human heads, covered nearly with vegetation, upon which the stone rests. The above monuments are found about 3,000 feet from the river Montagua. The time of Messrs. Catherwood and Stephens being short, they were unable to make more discoveries in that place; but they are satisfied that these monuments, &c., can be removed and taken to the United States of America, which is their intention; while those of Palenque are so far in the interior, it would be impossible to remove them. We also learn that the human figures, and the ornaments which appear about them, are all similar to those of Palenque. In fact, this we consider only as a prelude to what we shall expect from these distinguished, persevering, and scientific travellers. We learn these gentlemen will continue their journey, and after their visit to Palenque, will proceed to Mexico.—*New York Paper.*

Character of a fine Pansy, or Heart's Ease.—The chief object to be desired, is symmetry of the flower. The petals should be large, broad, and flat, lying upon each other, so as to form a circle and prevent anything like angles, or intersections of this circular outline. The petals should be as nearly of a size as possible, the two top ones being the largest, but so covered with the two side ones as not to appear disproportioned. The top petals should not wave or bend back. The lower petal should be broad and two-lobed, flat and not curving inwards; above an inch in breadth is a good size, the colors should be clear, brilliant, and not changing. The eye should not be too large, and it is accounted finest where the pencilling is so arranged as to form a dark angular spot. The flower stalk should be long and stiff, rather than slender.

Philoprogeniliveness.—We copy the following from the *Globe* of Wednesday, and recommend the Emperor's head to MR. DEVILLE as a "study."—"The Emperor of Morocco has a regiment of five hundred men,—*all his own sons.*"

REPORTS OF SCIENTIFIC MEETINGS

GEOLOGICAL SOCIETY.

List of the Papers read during the Session 1839 and 1840.

Dec. 4, 1839.—"Description of the Soft Parts and of the Shape of the Hind Fin of the Ichthyosaurus, as when recent," by Richard Owen, Esq., F. R. S., F. G. S.

"On as much of the great Graywacke System, as is comprised in the group of West Somerset, Devon, and Cornwall," by the Rev. D. Williams, F. G. S.

Dec. 18.—"Description of the Fossil Remains of a Mammal, a Bird, and a Serpent, from the London Clay," by Richard Owen, Esq, F. R. S., F. G. S.

"Observations on the Locality of the Hyracotherium," by William Richardson, Esq., F. G. S.

Jan. 8, 1840.—"On the Carboniferous and Transition Rocks of Bohemia," by David T. Ansted, Esq., F. G. S.

"On three Paramondras from the Chalk," by Rev. John Gunn, in a letter to Dr. Buckland.

Jan. 22.—"On the Boulder Formation or Drift, and associated Fresh Water Deposits, composing the Mud Cliffs of Eastern Norfork," by Charles Lyell, jun., Esq, F. G. S.

Feb. 5 —The President read an extract of a despatch from Consul Chatfield, dated San Salvador, Oct. 10, 1839, and forwarded to the Society, by Mr. Backhouse, by direction of Viscount Palmerston.

"On Orthoceras, Ammonites, and other cognate genera; and on the position they occupy in the animal kingdom, by Robert A. C. Austen, Esq., F. G. S.

"Memoir to accompany the Second Edition of the Geological Map of England and Wales;" by G. B. Greenough, Esq., V. P. G. S.

"On the Detrital Deposits of part of Norfolk, between Lynn and Wells," by Joshua Trimmer, Esq, F. G. S.

(To be Continued.)

ROYAL BOTANIC SOCIETY OF LONDON.

Aug. 11th. Thomas Wyse, Esq., M. P., V. P., in the Chair.

The Society had the honor of electing Her Royal Highness the Duchess of Kent a fellow of their body, after which Dr. Brewer was also elected a fellow; Dr. Arnold, of Kingston in Jamaica, then read a valuable paper upon a new property discovered by him in the *Datura Fastuosa*, that its application to the eye was followed by an almost immediate dilatation of the pupil; and he thought that the extraordinary powers of the plant, evinced its adaptation as a substitute for the *Belladonna*, which is very rarely of uniform strength, particularly such as is imported into Jamaica. Dr. Sigmond afterwards read a short, though interesting account, by Dr. Arnold, of the surprising knowledge of the poisonous properties of plants possessed by the colored inhabitants of the West Indies. The Chairman then addressed a few remarks upon the design for the gardens, as executed by the architect and Curator, Messrs. Decimus Burton, and Marnock, and observed that the laying out of the grounds was already commenced uuder the able superintendence of Mr. Marnock, the curator; and that the council anticipated that the major portion would be speedily prepared for the reception of the subscribers and the public.

BOTANICAL SOCIETY OF LONDON

Aug. 5. John Reynolds, Esq. Treasurer, in the Chair.

The secretary announced a donation from Dr. Ferdinand Krauss, of upward of 350 species of plants collected by him during his recent travels in Southern Africa, especially about Natal and Amazoula Land. Mr. J. A. Brewer forwarded living specimens of the rarer plants of Reigate, Surrey, for exhibition and distribution. Mr. Thomas Sanson exhibited a fungus, parasitic on a species of *Fulgora*? from Mexico. The secretary then proceeded to read the concluding part of Mrs. Riley's "*Monograph on Ferns*," embracing the mode of germination, raising from seed, &c. The sporule (or seed) of ferns differs materially in construction from the seed of flowering plants; it possesses no seed lobe, no embryo, nor any fixed point for the descending rootlet, and ascending plumule; as they will germinate from any point of their minute circumference, their manner of growth differs greatly from that of the seed of flowering plants. As late as the 16th century, ferns were generally supposed to be destitute of seeds, and now we read that "nothing is more easy than to grow them from seed." Tragi Kranterback is said to be the first botanist who mentions the seed of ferns, and it would scarcely be credited that a passage like the following could occur in his work, dated Strasburg 1630, "Without any superstitious notions I had often in vain sought for their seed, but found it abundantly on Midsummer eve, though I had not used any *spell, incantation*, or *magic figures*."

Some contemporary botanists maintained that the dust on the lower surface of the fronds *did* propagate the species; but others denied the fact, because they failed to make this dust germinate. Ehrart and Lindsay during the last century were the first writers who gave any correct account of the once magically-endowed fern seed. The successful process of Mr. Lindsay is described in the Transactions of the Linnean Society for 1794: the plan he gave, was to scatter the seeds on the surface of the mould, and keep them moist and warm. But Lindsay then resided in Jamaica, where the atmosphere possessed the very qualities which are necessary to ensure success, and Sprengel, after mentioning Lindsay's directions, acknowledges, "having received some fern seed from Ternate, I think I treated them according to the rules prescribed, yet not one of them came up, nor have I, in any one instance, succeeded by this process." Thus what seems perfectly easy in theory, is often difficult in practice.

Some recent writers on ferns seem to imagine that nothing is more secure or certain than raising a crop of ferns. To a certain extent they may be correct, as some species spring up readily, and even spontaneously, but the conclusion drawn, that *all* may be raised as easily, is not the fact; if this were the case how is it that the curators of our botanic gardens, many of whom are constantly striving to raise fresh species, do not show us living exemplars, of the beautiful varieties contained in different herbaria to which they have access, but which have never yet been displayed in any collection of living ferns.

The answer is, that growing ferns from seed is a *difficult, slow*, and *uncertain* process. *Difficult*, because when good seed is sown, constant care and watchfulness are necessary to preserve the soil and surrounding atmosphere in that precise degree of humidity, which is essential to its germination. *Slow*, for though under favorable circumstances the young plants may appear in a few weeks, it will require months, and seasons, before they attain maturity; and *uncertain*, because when one species appears to be sown, another may spring up. The seed, from its minutenes, is wafted by the lightest breath, and the sporule of one plant will float upon the air till stopped by some other force, where they remain. Two instances will suffice:—specimens of the *Aspidium Lonchitis*, and *Asplenium Fontanum*, were gathered at Wentworth, from plants growing in the open air: the *A. Lonchitis* was immediately folded up in a sheet of writing paper, and soon afterwards what appeared to be its genuine seed was sown, but the produce was the *Asplenium Fontanum*. Again, through the politeness of Mr. Paxton, Mr. Riley received specimens of various ferns gathered in the East Indies by the collector of Orchideæ for his Grace the Duke of Devonshire; some species hitherto unknown in England have been thus obtained, but several others spring up amongst these which have never intentionally been sown, and of which *no specimens* were contained in the packet; but these were also East Indian ferns, and the seeds had doubtless been transmitted from thence, or some of the fronds of their congeners. In 1819 a letter from Sir J. E. Smith was read before the Horticultural Society of London, describing a method of raising ferns, pursued with success by Mr. Shepherd of Liverpool, and the principle recommended by him has been found correct. Mr. Henderson's remarks on the germination of ferns are very valuable, because he has paid a lengthened and personal attention to the subject, and has been in many instances successful; but even he, with all the means and appliances to boot which are supplied by an extensive hot-house department, meets with occasional disappointments; so that even "when good seed is obtained," ferns are *not* raised with as much certainty as other plants.

In our next number we purpose giving the valuable remarks of the author, together with the process and care requisite for raising these beautiful plants from seed, which may be practised by those who delight in procuring and propagating these graceful gems of creation.

OBITUARY.

THE LATE JOHN RICKMAN, ESQ.

On the afternoon of Tuesday, the 11th inst., died at his residence, in Duke-street, Westminster, in his 70th year, John Rickman, Esq., the second clerk at the table of the House of Commons. Mr. Rickman was of liberal education, and enjoyed the society of some of the first scholars and ablest men of the day, amongst whom Southey may be named as an instance. He was the author of the prefaces and the arrangements of the population abstracts and returns, and various other valuable statistical Parliamentary returns, also of the "Life of Telford,' the engineer, &c. His labors in such departments' were invaluable, giving an interest to, and making those matters readable and comprehensible, which were apparently of the driest and most forbidding character. As an instance of his powers of application, it may be mentioned, that after the returns of the census of 1830 had been got ready, he was engaged in preparing the prefatory abstracts or results, and that so intent was he upon those labors that he never quitted them for six weeks or two months previously to their completion, until he had each morning heard the Abbey chimes announce that it was 3 o'clock. Before being appointed to the table of the House of Commons, he was private secretary to Mr. Abbott when that gentleman was Secretary for Ireland in 1801. When Mr. Abbott went to the House of Lords, Mr. Rickman prepared and printed, but for private circulation only, the different addresses of the Speaker on delivering the thanks or the reprimands of the House, preceded by an exceedingly interesting preface. He also prepared, and delivered before the committee on Parliamentary printing, a highly interesting sketch of Luke Hansard, the father of Parliamentary printing—an admirable piece of biography, pointing out the extraordinary habits of business, the industry, precision, and accuracy of the individual, with great force. Mr. Rickman was a relative of Clio Rickman, but he was at no pains to make that fact known. He had attended closely to his duties till within the last six weeks. His illness was a swelling or gathering in the neck, which rendered his breathing extremely difficult; and he could not for some time lie down, but was obliged to be bolstered up in bed. He died, however, with calmness and resignation. His salary was £2,000 a year, fixed by the Treasury on the revision of the offices. He is, as a matter of course, succeeded by Mr. W. Ley, heretofore third clerk, and brother of Mr. John Ley, the first, or rather "the clerk at the table." As it is a patent place, Mr. John Ley has the appointment of the third clerk, the salary of which is £1,500; and it is supposed that he will appoint thereto one of his own sons.

THE THEATRES.

Amidst the prevailing dearth of novelty in the theatrical world, we have devoted the space usually allotted to the Drama, to an article on the present state of the stage, which appeared in our contemporary, the *Sunday Times*, of last week. We have taken the liberty of omitting those portions of it which were evidently penned in a bitter and revengeful spirit, and have retained that only which is to the purpose. A perusal of the facts here thrown together, cannot fail to interest our readers, though it must be confessed that the picture presented is one of "melancholy" interest.

All we have to notice *here*, is the progress of Mr. David Rees, at the Haymarket. This gentleman was progressing well in the parts he selected for his first appearance, but he is now *forcing himself* upon us in the old favorite pieces of Liston. The consequence is, a lamentable failure. We have all the attitudes of Liston, the exact dress of Liston,—but not one sparkle of his humor. *Paul Pry*, represented on Tuesday for the first time, placed Mr. Rees in a situation truly lamentable. The fine acting of Mrs. Glover, as *Mrs. Subtle;* and Strickland as *Colonel Hardy*, stood out so highly in relief that the hero was extinguished. We never, indeed, saw this admirable comedy so cruelly burlesqued. We say this with the kindest feeling towards Mr. Rees, of whom we last week spoke encouragingly. He has humor of his own, and can *make* parts that will *tell* with his audience; why then should he voluntarily place himself in the lion's den, and call forth comparisons that must do him an almost irreparable injury? He may rely on it, those are *not* his friends who flatter his vanity. Let him be timely warned, and he may yet be a public favorite.

PRESENT STATE AND FUTURE PROSPECTS OF THE DRAMA.

[Abridged from the *Sunday Times.*]

"When things are at the worst"—the proverb is somewhat musty. "The present state" of the drama is dreary indeed; Drury having been closed nearly the whole of the present season, is let for the ensuing one, but whether for dramatic purposes, is unknown. The patent under which that theatre exists, has been repeatedly violated. Indeed, we state it as a known fact, that all the theatres in England have forfeited their patents or licenses long since. Killegrew's patent directs not only the licensing of new plays, but that "no old or revived play" shall be produced, until examined by the licenser. *Macbeth*, *Hamlet*, *Merchant of Venice*, and a hundred others, have never been so examined. In George the Third's patent to Drury, his Majesty is made to say, "It being our royal will and pleasure, that for the future our theatre may be instrumental to the promotion of virtue, and instructive to human life." Virtue has been promoted by the saloons, humanity instructed by the beasts of the forest.

Covent Garden, Drury Lane, and the Haymarket are licensed "to present all such theatrical performances as have heretofore, or that shall hereafter be permitted or allowed."

The English Opera.—"To represent English operas, ballets of action, and musical entertainments."

The Olympic.—"The entertainments of music, dancing, burlettas, spectacle, pantomime, horsemanship."

The Adelphi, St. James's, and Strand.—"Burlettas, music, dancing, spectacle, and pantomime."

[The four last-named theatres insert in all the pieces sent to the licenser a certain number of songs or choruses in each act, to form what is termed burletta; these songs and choruses not being intended to be sung at all, of which the licenser is well aware.]

All the other Metropolitan theatres are licensed for music and dancing only—in common with Bagniggo Wells, the Grecian and Albert Saloons, White Conduit House, and nearly a hundred public-houses.

The English Opera House has played farces without music, so has the Olympic, Adelphi, Strand, and St. James's, thereby incurring the forfeiture of their licenses.

During the present week, *The Merchant of Venice* is advertised at the Victoria, *Speed the Plough* at Sadler's Wells, and dramas at every other minor theatre. The Bayswater Albert Saloon advertises the performance of the melodrama called *The Blind Boy*, and the farce of *No Song no Supper*. Here is a perpetual and open violation of the law nightly occurring in some dozen places. "A law that cannot be enforced should be repealed."

The present state of the two national theatres is this: Drury owes about £230,000, Covent garden, £256,000 (the latter from Harris's statement in 1832.) To pay five per cent. on the debts, Drury should let for £11,500, and Covent Garden for £12,800 per annum!

The receipts at Covent Garden theatre were:—Season 1810-11, £98,110 4s. 8d.; season 1831-32, £43,318 19s. 11d. The average from the rebuilding until 1820, was £86,000 a year. The average from 1828 till 1831 did not exceed £42,000. Similar statements may be made as regards Drury Lane.

It has been averred (and statistics prove it) that the public like large theatres. When the great Covent Garden Company* went to the Italian Opera House (after the fire of 1808) they played to £338 houses on the average. When they crossed over to the little Haymarket, the receipts fell to £153 per night! Again in 1828 (the gas explosion) the plays that had attracted £350 at Covent Gardon, brought only £145 at the English Opera House. The same result ensued when the Drury Lane Company went to the Lyceum.

Assuming it, therefore, as proved, that the public have hitherto liked large houses—we ask why? Is not the answer obvious? it is because they were until very lately debarred from seeing either good pieces or good actors at small ones. The success of the Haymarket this and last season settles the question. Get talent, and small theatres will fill.

Did the public ever enjoy Liston at Covent Garden as they did at the Haymarket and the Olympic? Or the great Mathews at the Nationals as they did at the English Opera? Compare the effect produced by Mrs. Yates and Mrs. Keeley at Covent Garden and Drury Lane with those they achieved at the Adelphi. The finest points of *Victorine* and *Smike* would have been lost in a £700 house. The success of the Olympic under Elliston and Vestris, also proves that the public do like small theatres when great actors are to be found in them.

The first step towards regenerating the drama, would be to allow the minors to play any pieces written expressly for them, and a portion at least of the regular drama, and to keep all the saloons and singing-rooms to the very terms of their license—singing and dancing. The theatres could afford to throw them tumbling, rope-dancing, and horsemanship into the bargain.

If theatricals have declined in the metropolis, the provinces present as fearful a picture.

Bath (once the nursery of the stage) has ceased to pay for years.

The proprietor of the Liverpool theatre resigns this season.

The York circuit,† now confined to Hull, Leeds, and York, having ceded Sheffield, Doncaster, and Wakefield, barely pays its expenses.

Manley's circuit has been long in the market. The Norwich manager is forced to close some months in each year. Charles Hill has quitted Brighton abruptly, and that theatre is a commonwealth, *alias* a common poverty. Mr. H. Bennett manages to make Shrewsbury, Coventry, and Worcester pay; we question if any one else could. Munro does the same at Birmingham, but lost money at Leicester. Beverley extracts, with difficulty, a living from Sunderland and Shields. Young Elliston could do nothing with Leamington and Stratford-upon-Avon. Barnett does wretchedly in all his towns, save Oxford. Sloman made money at Dover, Rochester, &c., but by a system to which slave-driving was kindness; at present, those theatres do not pay. Shalders scrambles on at Southampton, Portsmouth, &c., but scarcely lives. Ternan (on the new broom principle) has done tolerably at Newcastle; but every one of the theatres enumerated have been invariably deserted when Batty or Ryan, or other equestrian troops, came in their vicinity. Dissenters are taught that it is sinful to go to the play, yet they visit equestrian and mountebank displays. In towns where a company of eight gentlemen and six ladies, at salaries not averaging less than 30s. per week each, cannot exist a month, an equestrian company, involving at least ten times the expense, will remain (making money) for six, seven, or eight weeks. This is the present state of dramatic taste in the provinces.‡ The returns to the authors, under Bulwer's Act, show that the worst and most trifling pieces are most frequently played, and that the amount received from country theatres is decreasing week after week.

Putting the case hypothetically, that the minors were protected according to our suggestion, the next reform must be in readers § and stage managers. It is clear, that a producing dramatist should not be the reader of a theatre. It is no answer, to instance Messrs. Morton, Reynolds, Planche, and Serle, all honorable men. They, in common with their predecessors, were placed in circumstances of suspicion; they had all pieces of their own to produce—private friends to serve—and must have been more than human if vanity and friendship did not sometimes warp their judgments.

Stage management has degenerated awfully. To be enabled to get up a play, it is, we presume, essential to understand it; how many stage managers of the present day do so, or attempt to do so, is not for us to say. The requisites for the situation are temper, common sense, education, some musical, some pictorial capability; an eye for effect, an ear for harmony, a knowledge of costume, and a clear perception of the antithetical working of a company, so as to bring one actor's peculiarities to bear upon another's. When the Macreadys, Keans, Farrens, Powers, and such small deer, are on the stage, the manager is mum. This is the new system—he abandons the care of the entire play to the domination of a single part. The result may be nightly seen.

Characters are cast, not from a consideration of the nature of the part itself, but a reference to the actor who last played it. Edward Knight (who stood some five feet) was at Drury, in 1816, cast stalwart "Little John" in *Robin Hood*, because he (Knight) succeeded to the situation of a tall actor, who had formerly personated it!

To every trade, save authorship and the stage, a man serves an apprenticeship, but actors, like critics, are all ready made. Seventy years since,

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* *i. e.*—J. and C. Kemble, G. F. Cooke, Young, Munden, Emery, Liston, Blanchard, Incledon, Fawcett, Jones, Simmons, Brunton, Grimaldi, Bologna, Norman, &c.; Mrs. C. Kemble, Mrs. H. Johnston, Mrs. Gibbs, Mrs. Davenport, &c.

† York was the school of Mrs. Siddons and of John Kemble. Elliston passed a portion of his early life there. Mrs. Jordan, Mrs Mountain, Suett, Emery, Fawcett, Mathews, Knight, Wrench, Melvin, J. Russell, all came to London from this circuit. Alas! there are no Tate Wilkinsons now. The Canterbury circuit (Mrs. Baker's) gave us Dowton; Bath fostered Mrs. Siddons and Elliston; Dublin, Jones and Farren.

‡ The declination of the drama is fatally proved by the little interest taken in the sayings and doings of the players. Eighteen years since, we had the "Theatrical Inquisitor," a monthly periodical, price 3s.; the "Stage," ditto, 1s.; the "Drama," ditto, 6d.; the "Mirror of the Stage," a weekly sixpenny pamphlet. Now, there is no magazine exclusively devoted to the stage.

§ Another crying evil is, having and not employing a reader. At Covent Garden last season, two or three pieces (which failed) had never been submitted to the reader at all.

Walker, in the preface to his dictionary, acknowledged that he had modelled his rules from Garrick's speaking. The stage was then the school for pronunciation, now it is for the greater part possessed by men who know no language but their own, and very little of that. We could name several performers, of some standing too, who cannot read at sight, and one who, until within the last seven years, could not read at all. At Covent-garden, four years since, a gentleman was engaged for important parts, who, being requested by Macready not to advance too far, replied, "Very well, sir, I'll stand a little more backer." It ceases to surprise us that such persons creep into theatres, when it is known that interest, not merit, governs the *entree*, and that the system of agency paralyses the provinces. Any young gentleman or lady, equally stage and moon-struck, may seek Messrs. Kenneth, Turnour, Sims, or Smithson, (and with no voucher but their own for their qualification) be sent into the provinces for a consideration. Persons are also recommended to London theatres, and we know how. Such is the system. We do not blame the men, who feel the stern necessity of eating.

These, and many other evils we have no space to enumerate, can only be cured by degrees. The first step must be an enactment, legalising the minor theatres, and restraining to their proper and intended purpose the singing-rooms.

ADVERTISEMENTS.

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Mining Journal Office, 37, New Broad-street, City, 27th June, 1840.

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INVENTIONS, TRADE, MANUFACTURES, LITERATURE, AND THE ARTS.

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No. 57.] SATURDAY, AUGUST 29, 1840. [PRICE FIVEPENCE STAMPED. CIRCULATING FREE BY POST.

CASES OF PATENT LAW IN FRANCE.

The *Tribunal de Premiere Instance*, of Paris, has recently given judgment in a case of patent law, which exemplifies the principle on which the claim to patent privileges depends in France, and exhibits an instance of a person who had obtained an illegal patent of invention, being compelled to pay damages to those whom he had proceeded against for the infringement of his alleged patent right. The following are the facts of the case:—

Messrs. Gelis and Conté had taken out a patent of invention for the application of a known substance, lactate of iron, for medicinal purposes. By the terms of the patent, all persons are prohibited from selling lactate of iron *in any form whatever*, whether in pills, syrups, opiates, powders, &c. The patentees had, under this alleged right, seized, at the shops of different druggists, medicines in which lactate of iron formed an ingredient, and they cited the vendors before the Correctional Police for the purpose of having them punished as infringers of the patent. Instead, however, of gaining their object, Messrs. Gelis and Conté were themselves compelled to pay damages to those whom they had attacked as counterfeits. The following is one of the grounds on which this decision was given:—

"Seeing that it is not established that the medicine for which Gelis and Conté have obtained their patent of invention, dated the 15th June, 1840, is either a new invention or discovery; that it is only a new preparation of the lactate of iron, a substance which has long been known and applied in the medicinal art; that it is a preparation which does not possess sufficient importance to constitute an invention; that if this new preparation is really superior to those used before or since, Messrs. Gelis and Conté will naturally derive advantage from the superiority of their article; therefore, the parties accused cannot be charged as counterfeits."

This judgment, and the reasons on which it is founded, is likely to operate against other patentees, who have taken out patents of invention for processes and inventions which consist merely in the adaptation of previously known machinery to different purposes. On this subject the *Journal des Arts Agricoles* makes the following remarks:

"It appears to us that the decision in the case of Messrs. Gelis and Conté is exactly applicable to the pretensions of M. Bataille to the construction of the three-wheeled harrows. The facts are these:—

"In 1828 or 1829 omnibuses on three wheels, called Tricycles, appeared in Paris. The first wheel, used instead of the two small wheels of ordinary carriages, turned on a pivot in all directions. That was a new invention.

"In 1832 M. Bataille, maker of agricultural implements, applied the plan of a pivot-wheel to three-wheeled harrows; and he took out a patent of invention for it, in which it was carefully stated that he claimed the right of applying to harrows the plan of the omnibus coaches on three wheels. To this application of the pivot wheel, M. Bataille also made many other additions of parts of machinery, previously well known. For instance, the hind wheels of the harrow are made to rise and fall by means of hooks; and he connects the fore wheels from the hind wheels of the harrow by hinges.

"The harrow which M. Bataille has constructed with these improvements, is admitted to be an excellent agricultural implement, of which farmers have been anxious to take advantage; and, as always happens in such cases, numerous constructors of agricultural implements, and farmers themselves, have adopted, modified, and improved, according to their different plans, the contrivances which M. Bataille has applied to the harrow. He in consequence seized these implements as being infringements of his patent; and charged the parties before the Correctional Police, as counterfeits, and obtained judgment against M. Potel, a farmer at Cretail. He then made arrangements with the others, and he appears to enjoy at present the fruits of his very questionable patent invention.

"If M. Bataille were the inventor of this useful instrument, we should be the first to maintain his right, but in our view of the case he has not this merit; the legality of his claim appears to us to be more than questionable, therefore it is we dispute it. But what says M. Bataille? 'I have been the first to apply to the harrow that contrivance which had been before applied to omnibus coaches.' In the first place, we might deny this priority; but we consent to admit it. The pivot wheel has been for a long time in various ways applied in the arts; the invention of it therefore does not belong to M. Bataille; all that he can strictly claim is that no one shall apply such a wheel to a harrow in the same method as himself, if that method be new. But, in the first place, his method is only the same as that of the old fashioned easters. Secondly, the application of the pivot-wheel has been made to harrows in other ways, particularly by means of wheels sliding one upon the other, like those in the three-wheeled omnibuses. So much for the claim to the pivot-wheel. Let us next examine the claim to the contrivance of the hind wheels being raised or lowered by means of hooks. M. Moland, and afterwards M. Rose, and many others, have applied this plan to the fore-wheels of the plough. This fact is so notorious, that we need not say more about it.

"There now only remains the claim to the contrivance for separating the hind wheels from the fore wheels, by means of which the former rise and are supported on the latter, as occasion requires. If M. Bataille were the inventor of this plan, it would be only right that he should profit by it; but if he have evidently copied the contrivance from the English, if this application be only analogous to that of the *rotary extirpator*, invented by Mr. Morton, of Edinburgh, in 1816, the claims of M. Bataille have no foundation, and it is the duty of the press to make the fact known to all farmers. It is impossible, after reading the description of Mr. Morton's invention, to deny that it is exactly the same as the contrivance of which M. Bataille claims to be the inventor. 'But,' say M. Bataille and his defenders, 'Morton's extirpator is not a harrow; and I am the first who has thought of applying to the harrow a contrivance which Morton invented and applied to another instrument. I claim the benefit of my idea.'

"It is clear that Morton's extirpator is not a tricycle harrow, since it does not move on three wheels; but it is an instrument analogous in its use to the harrow. This similarity in the uses of the two implements is, however, of not much moment; M. Bataille has copied from an English agricultural instrument, in use since the year 1816, his means of giving the hind-wheels of his harrow a separate vertical motion; he is not therefore the inventor of the method, even admitting that he is the first who has applied it to the trieycle harrow.

"The decision against Messrs. Gelis and Conté confirms the opinion we previously entertained respecting the pretended invention of M. Bataille. We only perceive one part of the machine which the constructor can strictly claim as his own; but when the same principle which M. Bataille has copied is applied by others in a different manner, however slight the difference may be, it appears to us that he has no right to charge the party with having infringed his patent right, because the invention is not his own, but is merely an adaptation of other persons' contrivances to a different instrument."

PROGRESS OF IMPROVEMENT IN GREAT BRITAIN.

The following interesting and sensible remarks on the Progress of Improvement in Great Britain, are from the fourth part, recently published, of *M'Culloch's Geographical, Historical, and Statistical Dictionary*:—

The means of internal communication in Great Britain are probably superior to those enjoyed by any other country. Our high roads, which, during the first half of last century, were execrable, have been signally improved since the close of the American war; and since the general introduction of the practice of *macadamising*, they may be confidently pronounced to be the very best in Europe. With the exception of Holland and Belgium, no country is better supplied with canals; and by these means, and the aid afforded by our numerous navigable rivers, the conveyance of the bulkiest articles has been rendered both easy and cheap. Railroads seem now, however, to be likely to supersede most other methods of conveyance, in so far at least as the transit of passengers and of the lighter and more valuable species of goods are concerned; and the wonderful speed with which lengthened trains of carriages are impelled by locomotive engines along these roads is among the most valuable and astonishing results of modern science and discovery. By facilitating travelling to a degree that could not a few years ago have been conceived possible; rendering all the great markets of the empire easily accessible to the products of the remotest districts; obliterating local prejudices and customs; reducing the country to a homogeneous mass; and producing everywhere a spirit of emulation and competition,—our improved means of communication are exercising an influence of the most powerful kind, and which cannot be too highly appreciated. Still, however, it has been doubted whether these extraordinary improvements in the arts, and the vast extension of commerce, have conferred any real and important advantage on the bulk of our people. That they have added prodigiously to the field of employment is certain; but it has been contended that the increase of population and consequently of the demand for labor, has been equal, or nearly so, to the increase of employment; that the condition of the people has not been materially improved; and that their command over the necessaries, conveniences, and enjoyments of life have not been augmented in anything like the degree in which their numbers have increased. There is really, however, no truth in these representations. The condition of the great bulk of the people of Britain, and especially of the laboring classes, has been signally and indeed astonishingly improved since the middle of last century. The greatest possible ameliorations have been effected in the interval, in the diet, dress, and lodging of all classes. Towards the middle of last century, about half the people of England were consumers of barley, rye, and oat bread; whereas at present not a tenth part of the population use any bread unless made of wheat. The consumption of butchers' meat, as compared with the population, has also doubled or more in the interval; and the extraordinary increase in the consumption of tea, sugar, coffee, and such like articles, is too well known to require being pointed out. The improvements that have been made in clothing and lodging are, if possible, still more remarkable. Linen shirts, that were formerly luxuries, used only by the richer classes, are now worn by every body; and the old, coarse, comfortless home made cloths have been wholly superseded by the better and cheaper products of the factories. The cheapness, to specify one instance, and extraordinary abundance of cotton fabrics, have given the poorest females the means of greater comfort, neatness, and display in dress, than were enjoyed by the highest classes in the first half of last century. And any one who compares the old farm houses and cottages, or the houses in the old narrow streets and lanes in any one of our great towns, with the farm houses, cottages, and town lodgings for the poor, built within the last fifty, and still more the last thirty years, will at once be sensible of a vast improvement. Essential as glass windows may now appear, in the sixteenth century they were luxuries, all but unknown, in the castles of the principal nobility in England; and in Scotland, in the early part of last century, glass was seldom seen in the windows of the first class of country houses, and never in cottages. The latter were then also almost universally destitute even of chimneys! But the liberal use of these and of glass is not the only circumstance in which modern houses excel those built previous to the American war. The former are in all respects superior. They are constructed on a larger scale; the apartments are more spacious and lofty; they are better ventilated; and are supplied with water to an extent of which our ancestors had no idea. It is, in fact, to the better construction of houses, the greater width of streets, and, above all, to the abundant supply of water and the effective system of under-ground drainage that now exists, that the entire freedom of our great towns from epidemic diseases, and the wonderful improvement in the health of the inhabitants, are mainly to be ascribed. Signal as the spread of improvement has been every where throughout Great Britain since 1750, it has been greatest in Scotland. This, no doubt, has been principally owing to the fact of Scotland being previously in a comparatively backward state. But its progress since the epoch referred to, or rather since the close of the American war, has been all but unprecedented; and if at all, has only been surpassed by the progress made by Kentucky and one or two more of the American states. In Ireland, we regret to say, improvement has been much less rapid than in any part of Great Britain; but even there a considerable advance has been made; and the fair presumption seems to be, now that the civil disabilities under which the Catholics labored have been removed, that improvement will proceed with an accelerated pace. If anything more than has been already stated were required to establish the astonishing improvements in the condition of the people of Great Britain during the last fifty years, it would be evinced by the decrease that has taken place in the rate of mortality since 1760 and 1770. The extreme limit of human life assigned by the Psalmist, has not indeed been extended; but a much larger proportion of those born, arrive at or approach to that limit than formerly. The probable life of a male annuitant five years of age, (a picked life,) at the commencement of last century, has been found to be 39.03 years; whereas it appears that the probable life of a male of five years of age, taken at an average of the mass of the population, from 1813 to 1830, was not less than 49·80, or nearly eleven years greater than the former! This extraordinary improvement must no doubt be ascribed to a variety of causes; partly to the drainage of bogs and marshes, by which agues and marsh fevers have been entirely banished from many districts; partly to improvements in the diet, dress, lodgings, and other accommodations of the mass of the people; partly to the greater prevalence of cleanliness; and partly, and since 1800 chiefly perhaps, to discoveries in medical science, and the extirpation of the small-pox. But, however explained, this and the facts mentioned above, show conclusively that the beneficial influence of the extraordinary improvements in arts and sciences made during the last sixty or seventy years, has not been countervailed by the increase of population, and that it has not been confined to the upper and middle classes. On the contrary, these improvements have been especially beneficial to the laborers. The latter are at this moment incomparably better fed, better clothed, and better lodged, than at any former period of our history; and, in point of fact, daily enjoy, and reckon as indispensable, a great number of articles of convenience and luxury that formerly could rarely be obtained even by the richest lords.

SUSPENSION BRIDGES.

To the Editor of the "Inventors' Advocate."

Sir,—In the 48th number of your excellen journal, Dr. Wilkinson has fallen into an error in stating, that the bridge at Hammersmith, over the Thames, was the first suspension bridge for the transit of heavy goods, and erected by Captain Brown. This bridge was erected by W. Teirney Clark, the architect of a suspension bridge over the Danube, between Buda and Pest. Captain Brown erected Bar Chain Bridge, in 1818-19, across the Tweed, and was only 11 months completing it.

The use of bichloride of mercury, for preserving anatomical preparations, has been long known; and perhaps Dr. Wilkinson forgets the patent of John Howard Kyan, for preserving timber, canvas, and cordage from decay, by saturating them with a solution of that salt?—I am, Sir, yours obediently, Pyro.

August 27, 1840.

THE SUGAR PANIC.

A few months ago, it was generally believed that the supply of sugar would be insufficient for the demands of the current year. Rumours had been spread abroad regarding the failure of the crops in the West Indies, the insubordination and the laziness of the laborers—references were made to the shortness of the stock in hand—till all except the knowing ones began to imagine that a very great deficiency of sugar did exist. This fear became general; and almost every one who had the means bought as much sugar as would serve for a twelvemonth's consumption. Dealers in that article, thinking that the prices would be higher, increased their stocks to the utmost of their abilities. In short, nothing was so general as a run upon sugar. These extraordinary purchases rapidly reduced the stock, and made the price of sugar advance, and continue for a time at a rate far beyond what it otherwise would have done had no such speculation taken place. The dearth of this article compelled the poorer classes to be contented with a more limited supply than they would otherwise have been; and as a quantity greater than usual has come into market during the last three weeks, it has now become apparent to all that the exorbitant price at which sugar has been sold of late can be no longer maintained. Agents in the country are now offering it at 2s. 6d. per cwt. below the prices of last month, and yet cannot effect sales. There is, therefore, every probability that the prices will continue to decline. Those among the affluent who were smitten with the sugar epidemic, are out of the market for many months; and as the price of provisions will continue high till the harvest be got in, there is no probability that the demands of the lower classes will be materially increased.—*Dundee Chronicle.*

A LIST OF PATENTS SEALED

FROM JULY 30TH TO AUG. 27TH, 1840.

(*Continued from page 67.*)

ENGLAND.

John Louis Bachelard, of St. Martin's-lane, gent., for *improvements in the manufacture of beds, mattrosses, chairs, sofas, cushions, pads, and other articles of a similar nature.*—6 months, being a communication, July 30.

Felix troubat, of Mark-lane, merchant, for *improvements in the manufacture of vinegar.*—6 mths. Aug. 1.

William Daubney Holmes, of Lambeth square, civil engineer, for *certain improvements in steam-engines, and in generating and applying steam as a motive power.*—6 months, Aug. 1.

THOMAS BARNABAS DAFT, of Birmingham, gent., for *improvements in inkstands or inkholders*.—6 mths., Aug. 1.

JAMES TAAFFE, of Shaw-street, Dublin, builder, for *improvements in roofing and slating houses and other buildings*.—6 months, Aug. 1.

JAMES HODGSON, of Liverpool, engineer, for *a new mode of combining and applying machinery for the purpose of cutting and planing wood, so as to produce plane or moulded surfaces*.—6 months, Aug. 3.

JOHN SANDERS, and WILLIAM WILLIAMS, of Bedford, iron-founders, and SAMUEL LAWRENCE TAYLOR, of Old Warden, Bedford, machine-maker, for *improvements in ploughs*.—6 months, Aug. 3.

GEORGE EDWARD NOON, of High Holborn, engineer, for *improvements in pumps, and in engines for drawing beer, cyder, and other fluids*.—6 months, Aug. 3.

WILLIAM SAUNDERS, of China-terrace, Lambeth, chemist, for *certain improvements in paving streets, roads, and ways*.—6 months, Aug. 3.

WILLIAM BEITSON, of Brick-lane, Old-street, brass-founder, for *improvements in water-closets and stuffing boxes, applicable to pumps and cocks*.—6 months, Aug. 3.

COLIN MACRAE, of Cornhill, Perthshire, gent., for *improvements in rotary engines worked by steam, smoke, gases, or heated air, and in the mode of applying such engines to useful purposes*.—6 months, being a communication, Aug. 5.

THEOPHILUS RICHARDS, of Birmingham, for *certain improvements in cutting or sawing wood*.—6 months, being a communication, Aug. 5.

HENRY TREWHITT, of Newcastle-upon-Tyne, Esq., for *improvements in applying the power of steam engines to paddle shafts used in propelling vessels*.—6 months, being a communication, Aug. 7.

REBERT STIRLING NEWALL, of Dundee, Gent., for *improvements in wire ropes, and in machinery for making such ropes*.—6 months, being partly a communication, Aug. 7.

ANDREW SMITH, of Princes-street, Leicester-square, engineer, for *certain improvements in carriage wheels, rails, and chairs, for railways*.—6 months, Aug. 7.

THOMAS JOHN DAVIS, of 5, Bloomsbury-square, Esq., for *certain improvements in the form and combination of blocks, of such materials as are now used or hereafter may be used in building, or for paving public or private roads and court-yards, or public and private causeways and subways, or any other purposes to which the said form and combination of blocks may be applied*.—6 months, Aug. 8.

DOWNES EDWARDS, of Surbiton Hill, Kingston, Surrey, farmer, for *improvements in preserving potatoes and other vegetable substances*.—6 months, Aug. 8.

JOHN ISAAC HAWKINS, of College-place, Camden Town, civil engineer, for *an improvement or improvements in buttons, and in the modes of affixing them to clothes*.—6 months, being a communication, Aug. 8.

FRANCIS WILLIAM GERISH, of East road, City-road, ironmonger, for *improvements in apparatus to be used as a fire escape, also applicable to other purposes where ladders are used*.—6 months, Aug. 8.

SAMUEL HOWARD, of Manchester, engineer, for *certain improvements in boilers and furnaces*.—2 months, Aug. 8.

BARON CHARLES WETTERSTEDT, of Limehouse, for *improvements in preserving vegetable, animal, and other substances from ignition and decay*.—6 months, Aug. 11.

JOHN PETER ISAIE PONCY, of Wells-street, Oxford-street, watch-maker, for *improvements in clocks and chronometers*.—6 months, being a communication Aug. 13.

MILES BERRY, of Chancery-lane, patent agent, for *certain improvements in the arrangement, construction, and mode of applying certain apparatus for propelling ships and other vessels*.—6 months, being a communication, Aug. 14.

PIERRE ARMAND LE COMTE DE FONTAINMOREAU, of Skinner's-place, Size-lane, London, gent,, for *certain improvements in covering and coating metals, and alloys of metals*.—6 months, Aug. 15.

JOHN YOUNG, of Wolverhampton, Stafford, iron-master, for *improvements in the manufacture or construction of knobs, handles, frames, tablets, boxes, and other ornamental articles, applicable to the decoration of houses and domestic furniture*.—6 months, Aug. 17.

LUKE HEBERT, of Birmingham, civil engineer, for *certain improvements in the manufacture of needles*.—6 months. Aug. 17.

JOSEPH LOCKETT, of Manchester, engineer, for *certain improvements in manufacturing, preparing and engraving cylinders, rollers, or other surfaces for printing or embossing calicoes, or other fabrics*,—6 months, Aug. 27.

CHARLES SMITH, of Exeter, builder, for *improvements in the manufacture of lime and cements, or composition*.—6 months, Aug. 27.

WILLIAM CHURCH, of Birmingham, civil engineer, for *improvements in fastenings, applicable to wearing apparel, and in apparatus for making the same and like articles; also in the method or methods of preparing the said articles for sale*.—6 months, Aug. 27.

HUGH UNSWORTH, of Blackwood, Lancaster, bleacher, for *certain improvements in machinery or apparatus for mangling, drying, damping, and finishing woven goods or fabrics*.—6 months, Aug 27.

PHOMAS ROBINSON WILLIAMS, of Cheapside, gent., for *certain improvements in measuring the velocities with which ships or other vessels or bodies move in fluids, and also for ascertaining the velocities of fluids in motion*.—6 months, Aug 27.

BENJAMIN HICK, jun., of Bolton-le-Moors, Lancaster, engineer, for *certain improvements in regulators or governors for regulating or adjusting the speed or rotary motion of steam-engines, water-wheels, and other machinery*.—6 months, Aug. 27.

HENRY WATERTON, of Fulmer-place, Gerard's-cross, Buckingham, Esq., for *improvements in the manufacture of sal ammoniac*.—6 months, Aug. 27.

EXPIRED PATENTS.

PATENTS THAT HAVE EXPIRED DURING THE WEEK ENDING AUGUST 22, 1840.

ENGLAND.

JOHN THOMAS THOMPSON, of Long-acre, camp-equipage maker, *improvements in making or manufacturing metallic tubes, whereby strength and tightness are obtained, and for applying them with various other improvements to the construction of the metallic tube and other bedsteads*, Aug. 17.

JOHN CHARLES SCHIWIESO, Regent-street, musical instrument maker, for *improvements in certain stringed musical instruments*, Aug. 22.

TIMOTHY BURSTALL, of Leith, and JOHN HILL, of Bath, engineers, for *improvements in the machinery for propelling locomotive carrioges*, Aug. 22.

SPECIFICATIONS.

A LIST OF SPECIFICATIONS

ENTERED AT THE ENROLLMENT OFFICE, UP TO THE WEEK ENDING AUGUST 22, 1840.

(*Continued from page* 114.)

ENGLAND.

JOB CUTLER, Lady-pool-lane, Sparkbrook, Aston, Warwick, and THOMAS GREGORY HANCOCK, Highgate, Birmingham, Warwick, machinist, *an improved method of cutting corks, and constructing the necks of bottles*, Aug. 22.—This improved method of cutting cork, consists of a mode of constructing and applying certain hollow revolving cutters and apparatus to hold the cork when being cut. The cutter being cylindrical, with a slit in it that has a sharp edge, is placed at each end of the rod that revolves by the aid of a driving band; as soon as the cork is shaped by the cutter, an interior rod presses forward to release the cutter or cutters of the cork or corks; thus the cutters are continually revolving, and the workman has only to present the corks in a suitable frame in order to have them finished and prepared for the neck of a bottle.

The second improvement is for making the necks of bottles with raised spiral surfaces to receive the cork, which has a spiral grove adapted for the purpose of entering the neck of the bottle. The spiral thread, or raised surface, is formed while blowing the bottle on a proper shaped mould, and the cork in cutting requires to have a spiral groove. The principal object of this improvement is to retain in the bottle any volatile matter that may be likely to escape by the ordinary method of corking bottles.

RICHARD CUERTON, jun., Percy-street, Middlesex, brass-founder, *improvements in the manufacture of cornices, mouldings, and window-sashes*, Aug. 22.—This invention relates to a mode of shaping and affixing sheet metal on the surfaces of cornices and window-sashes, and thus covering the mouldings thereof by means of dies and pressure, whereby the front surfaces of such cornices, mouldings, and window sashes have all the character of metal without the weight thereof.

The sheet of metal is first sunk or shaped in a proper mould by the aid of a die, and the wood, being worked to the same mould, receives the metal as an outward skin or coating.

The claim is only for the mode of employing such sheets when sunk, and by fixing them on wood or other suitable mouldings by means of dies and pressure, and afterwards turning over the edges so as to secure them.

WILLIAM COOK, King-street, Regent-street, and Liquorpond-street, coachmaker, *certain improvements in carriages*, Aug. 22.—The improvement relates to that description of carriages wherein what are called German shutters are used to close them, and the invention consists of a mode of constructing and applying certain apparatus to such carriages, to facilitate the working and moving of such shutters. A cylindrical box with a ratchet and clicks has a spring similar to the main spring of a watch enclosed; and to the outside of this box is attached a cord connected with a part of the shutter. Three or more of these are put into a case which is placed at the fore part of the head of the carriage; thus, by the aid of a cord connected with the catch of the cylindrical boxes, a person seated in the carriage may raise or fold up the shutters with little or no trouble, as the springs of each draw the cords leading to ends of the German shutter which forms three separate parts or leaves.

THOMAS KERR, of Forecrofts Danse, Berwick, North Britain, *a new or improved mortar or cement for building, also for mouldings, castings, statuary, tiles, pottery, imitations of soft and hard rocks, and other useful purposes, and which mortar or cement is applicable as a manure for promoting vegetation and destroying noxious insects*, Aug. 22.—The inventor claims the use of three compounds or mixtures, which he employs separately, or combined according to the required application for use.

1. The combined use of road dust, cinder, sand, &c., which are beaten or ground to a very fine powder, and afterwards sifted.

2. The use of chalk or other calcareous matter to be combined, and applied as the necessity may require.

3. The use of tar, pitch, or other such like bituminous or fatty substance, for the purpose of coating the roots of plants, whereby they are protected against vermin or other noxious insects.

Lastly, for combining these three compounds in

such manner as may be applied for use according to the title of this specification.

ENTERED AT THE PETTY BAG OFFICE, UP TO THE WEEK ENDING AUGUST 22, 1840.

(Continued from No. 56.)

ENGLAND.

WILLIAM HUNT, Portugal hotel, Fleet-street, manufacturing chemist, *improvements in the manufacture of potash and soda, and their carbonates*, July 21.—The inventor claims the novel method of producing potash or soda by the action of deutoxide of copper or zinc on sulphuret of potash or soda, but the different processes given are so elaborate that it would be impossible to collect by memory in what manner the invention is put into operation. A principal feature of the improvements consists in the method of decomposing and liquifying the sulphate of potash or soda through a bed of coal, which is placed in a slanting direction, so as to form a long and narrow furnace; the grates holding the fuel in connection with the bed of coal are placed at each end, and the smoke or vapor passes at a chimney situated in the centre; doors are placed at intervals along the narrow furnace in order to supply coal when requisite, and at the upper end is a door to admit the sulphate of soda or potash, which in becoming liquified passes through the whole bed of heated coal, and is discharged by an opening at the lower end of the long and narrow trough or furnace.

ANTOINE BLANC, of Paris, and Sabloniere hotel, Leicester-square, merchant, and THEOPHILE GERVAIS BAZILLE, Rouen, France, merchant, *certain improvements in manufacturing or producing soda and other articles obtained by or from the decomposition of common salt or chloride of sodium*, Aug. 12.—A body of sand well saturated with sea water is put into a porcelain tube or receiver, and brought to a cherry red heat, when a vapor of water is gradually introduced so as to form a silicate of soda, which being allowed to cool is lixiviated to free it from the impurities of the sea water.

The silicate of soda being afterwards fused in a crucible, forms a vitrified mass, which becomes soluble in water; a stream of carbonic acid gas is now admitted until flakes of silica are deposited, and carbonate of soda will remain in solution, which, when poured off, must be evaporated and calcined in the usual method adopted by operative chemists.

THOMAS ROBINSON WILLIAMS, Cheapside, London, *certain improvements in the manufacture of woollen and other fabrics, or fabrics of which wool or fur form a principal component part, and in the machinery employed for effecting that object*, Aug. 14.—This improved method of forming woollen fabrics is done by a process of felting.

One mode is to collect the long sliver as it unfolds from the doffer of a carding machine. Two long endless cloths or aprons, and about the width of the fabric, are made to touch each other, and to carry between the two, the thin coats of long sliver, and thus in collecting a continuous series of the same forms a bat round the upper band or apron. When a bat of the required substance is formed, it is then removed and passed with the apron through a series of pressing rollers, between which are perforated pipes to allow steam to moisten the fabric so as to bind the fibre and give it a more solid body. The bat now passes through the improved felting machine, which consists of a series of rollers placed in a long trough of soap and water, or other saponaceous matter; a second series of rollers are placed so as to fit between the angles of the lower rollers, thus, by suitable machinery known to all mechanics, the rollers are made to reciprocate or vibrate, by which means the bat of material is firmly combined, and forms a cloth or fabric equal or even superior to cloth made by looms.

In order to vary the process of rolling the fabric, rollers are placed diagonally, by which means the cloth obtains a more perfect texture, and becomes greatly improved.

The short wool or fibre is felted by the usual process, or according to the last improvement of felting; that is, the devil's picker working in a box, causes the fibre to settle on a fine wire drum, from which two small rollers collect the sheet of material and pass it along an elastic bed, over which are a number of rams worked by tappet wheels, thus forming the felted material into cloth.

The inventor also claims the use of soap and water, or saponaceous matter, in place of acid or acidulated waters, used for the purpose of felting, and causing the fibre to bind more readily.

NOTICE.

In accordance with the determination expressed in our 26th Number, of giving one month's clear notice to Inventors, before publishing their specifications, we hereby inform the following Patentees, that their specifications will be published in the "INVENTORS' ADVOCATE" of Oct. 3. Each party will receive, in addition, a *private* communication to the same effect.

Charles Keene, Sussex-place, Regent's-park, due Sept. 23.
William Newton, Chancery-lane, due Sept. 23.
Samuel Hill, Sloane-street, Chelsea, due Sept. 25.
Elhanan Bicknell, Newington Butts, merchant, due Sept. 25.
William Palmer, Sutton-street, Clerkenwell, candle-maker, due Sept. 25.
Henry Smith, of Birmingham, lamp-maker, due Sept. 25.
George Richard, and Henry Elkington, Birmingham, due Sept. 25.
John Crosfield, Warrington, soap-maker, due Sept. 25.
Samuel Knight, Woodhouse-mills, Lancaster, bleacher, due Sept. 25.
James Hay, of Belton, Scotland, captain in Royal Navy, due Sept. 25.
Alexander Southwood Stocker, Birmingham, manufacturer, due Sept. 27.
Richard Prosser, of Cherry-street, Birmingham, civil engineer, due Sept. 27.

FOREIGN PATENTS.—FRANCE.

FIRST QUARTER OF 1839.

A LIST OF PATENTS GRANTED BY THE FRENCH GOVERNMENT FROM FEB. 10, TO MARCH 12, 1839.

(By Royal Decree, dated Aug. 26, 1839.)

(Continued from No. 56.)

No. 73. Loysel, Jean Baptiste Michel Réné, represented by Perpigna, 10 years, for *a new game of combination, called "jeux Loysel,"* Feb. 19, 1839.

74. Luszlewki, Adam, addition to patent for 15 years, dated Jan. 31, 1839, for *a new system of paving, flooring, and constructing hydraulic works*, Feb. 19, 1839.

75. Milne, James, represented by Calla, son, 15 years, for *a new gas metre*, Feb. 19, 1839.

76. Mitifiot, François, 5 years, for *a process for preventing the breaking of silk in winding it*, Feb. 19, 1839.

77. Nicole, Jean Céleste, and Finbert, Louis Severin, 5 years, for *a smoke-burning apparatus, applied to lighting purposes, called "appareil Finbert,"* Feb. 19, 1839.

78. Pezerat, Pierre Joseph, addition to patent for 15 years, dated Nov. 24, 1838, for *the manufacture and use of a granitic bitumen*, Feb. 19, 1839.

79. Pasquier, Jacques Isidore, 5 years, for *a new arrangement of carriages for the conveyance of animals*, Feb. 19, 1839.

80. Ragoneau, François Marie, 5 years, for *the use of the fibre of the cocoa-nut, instead of horse-hair, for sofas, furniture, carriages, &c., for the manufacture of carpets, brushes, and of all articles made of hair*, Feb. 19, 1839.

81. Rotch, Thomas Dickason, represented by Perpigna, addition to patent for 15 years, dated Nov. 22, 1838, for *improvements in the manufacture of soap*, Feb. 19, 1839.

82. Saski, Dominique, 10 years, for *a new furnace called "fourneau Saski,"* Feb. 19, 1839.

83. Vigezzi Riva, Dominique, and Doninelli, Auguste, 10 years, for *a machine for milling organsine and thread silk more perfectly than has been hitherto done*, Feb. 19, 1839.

84. Audue, Jean Baptiste, represented by Reynaud, 10 years, for *the combination of various machinery for manufacturing plain, figured, and varied tissues, mixed or not with lace point*, March 1, 1839.

85. Barral, Antoine, 5 years, for *a new and commodious umbrella spring without slits, which he calls a double slider, with intermediary spring*, March 1, 1839.

86. Chavin, Julien Etienne, and Dlle. Chavin, Marie Louise Augustine, 5 years, for *the application of weaving, knitting, or frame-work to the making of buskins, light boots, and a new kind of shoes called by them "Neupodémes,"* March 1, 1839.

87. Cornu, Eugène Alfred, 5 years, for *a mechanical roller, for the purpose of removing heavy loads*, March 1, 1839.

88. Fillon, Jean Gabriel, seventh addition to patent for 10 years, dated March 14, 1838, for *a new system of levers, called "leviers Fillon," for the purpose of levelling and removing earth, also applicable to commercial transport, to lading and unlading vessels, and particularly to railroads and canals*, March 1, 1839.

89. Franchot, Charles Louis Felix, represented by Perpigna, addition to patent for 15 years, dated Dec. 27, 1839, for *an air-engine for producing rapid changes of temperature in a gaseous medium, in close vases, and for transmitting the motive power resulting therefrom, without any contact of the gases with the moving surfaces and joints*, March 1, 1839.

90. Gerle, Cyx Pierre, 15 years, for *a means of manufacturing transparent waterproof paper*, March 1, 1839.

91. Jecker, François Antoine, 15 years, for *the application of the hydrostatic paradox as a motive power, obtained by means of gases, or mixture of gases with steam, and for a new machine for working this invention*, March 1, 1839.

92. Journet, Pierre, addition to patent for 15 years, dated July 25, 1838, for *a machine "omnitolle," called "machine omnitolle Journet," or the purpose of removing earth, stones, and all substances and materials drawn from the earth; also adapted to pumping and drying wells*, March 1, 1839.

93. Lhomme, François, 10 years, for *a new arrangement of iron staircase*, March 1, 1839.

94. Peuzoldt, Gottfried, addition to patent for 10 years, dated Dec. 22, 1837, for *a machine on the principle of centrifugal force, for the purpose of drying wool, and all kinds of stuffs, as well as the fecula of potatoes*, March 1, 1839.

95. Sicardo, George, 15 years, for a *rotary engine, for applying the system of rotation to the use of steam-power*, March 1, 1839.

96. Bonfil, James, represented by Perpigna, addition to patent for 15 years, dated Sept. 29, 1839, for *improved valves, which, in combination with other mechanical arrangements, allow of employing motive power, obtained by atmospheric pressure, for driving railroad carriages*, March 8, 1839.

97. Brown, Edward, represented by Perpigna, 15 years, for *improvements in machines for spinning, twisting, and doubling cotton, silk, wool, flax, hemp, and other fibrous substances*, March 8, 1839.

98. Cousin, Alexandre, represented by Perpigna, 15 years, for *a rotary engine for making bricks, tiles, &c., together with a machine for preparing the clay, and which is likewise adapted to moulding turf*, March 8, 1839.

99. Coutures, brothers, 5 years, for *the manufacture of glass-stoppers of every kind, applicable to bottles, decanters, &c.*, March 8, 1839.

100. Edwards, Henri Hind, represented by Perpigna, 10 years, for *improvements in locomotive engines*, March 8, 1839.

101. Gaudon Aubry, Pierre Etienne, and Robert, Auguste Joseph, represented by Perpigna, 10 years, for *improvements in muskets, whereby with one barrel several shots may be fired without reloading*, March 8, 1839.

102. Huerne de Pommeuse, Michel Louis François, and Janvier, Louis, addition to patent for 15 years, dated Nov. 22, 1838, for *new means applicable to steam navigation on seas, rivers, and canals, and which may be employed separately or together*, March 8, 1839.

103. Jolly, Adolphe Eugene Louis, 5 years, for *improvements on pen-holders*, March 8, 1839.

104. Irroy, Stanislas, addition to patent for 15 years, dated Jan. 31, 1839, *for a heating apparatus*, March 8, 1839.

105. Leclerc, Pierre Charles, addition to patent for 10 years, dated July 31, 1837, for *a new musical instrument with double bellows, and keys, and cords, producing at will, and imparting the tones of violin, clarinet, and violoncello*, March 8, 1839.

106. Mauger, Nicolas François, 5 years, for *an economical furnace on a new principle*, March 8, 1839.

107. Mordan, Samuel, represented by Truffaut, 10 years, for *improvements in the construction of rotary steam-engines*, March 8, 1839.

108. Muel, Doublat, 15 years, for *new methods and processes of making horse shoes*, March 8, 1839.

109. Renaud de Vilback, fourth addition to patent for 15 years, for *a system of railroad*, March 8, 1839.

110. Souchon, Jean Marie, 15 years, for *clarifying and filtering common water for domestic purposes, factories, &c.*, March 8, 1839.

111. Tautet, Christophe, and Hamelin, Pierre Nicolas Auguste, 15 years, for *processes and apparatus employed in melting tallow by steam*, March 8, 1839.

112. Tharaud, Pierre, 10 years, for *modes and processes of luting, fixing work, and laying down glazed pipes of baked clay, serving as conductors of air, liquids, steam, and gas*, March 8, 1839.

113. Boudet, Felix Henri, addition to patent for 15 years, dated Dec. 5, 1838, for *a chemical process of preparing hides or skins intended to be tanned or tawed*, March 12, 1839.

114. Chabert, Etienne, 5 years, for *a new form of iron combs*, March 12, 1839.

115. Claro, Augustin, 5 years, for *a water, which he calls "water of Mars," a cure for the tooth ache*, March 12, 1839.

116. Cousin, Emmanuel, 5 years, for *a new wagon adapted to railroads and common roads*, March 12, 1839.

117. Degrand, Elzeard, third addition to patent, for 15 years, dated July 19, 1837, for *improvements in steam-engines*, March 12, 1839.

(To be Continued.)

FOREIGN CORRESPONDENCE.

FRANCE.

MILITARY FORCE OF FRANCE.

We quote the following from the *Constitutionnel*:—"Since the revolution of July, the military forces of France have been increased to an extent beyond what is commonly conceived. This is owing to the due execution of our admirable laws for recruitment, and to the National Guard. During this period of ten years, a million of young Frenchmen, the eldest of whom have scarcely attained their 30th year, have been enrolled in the active army, or have been incorporated in the reserve. This number, which is perfectly correct, is founded on the calling out, at the end of 1830, of the classes of previous years, and of the annual contingent of 80,000 men, without reckoning volunteers. This million of soldiers is still under arms, or forms part of the reserve, or else of the moveable National Guards, who, in our 37,000 communes, have attained a degree of military discipline which cannot escape observation. The Government, therefore, in case of need, has at its disposal an effective force, which is the more powerful, as it is composed of men already inured to the use of arms, and for whom able officers will not be wanting, as it is well known, that, besides those now in full pay, and at the military schools, we have upwards of 3,000 such officers either on half-pay or on the reformed list. In fine, among the million of soldiers attached to our regiments, and the army of reserve, may be reckoned 15,000 non-commissioned officers, whose promotion to the rank of officers has been alone prevented by the reduction of the army.

Among the prizes proposed for 1841, by the Society for the Encouragement of National Industry, at Paris, are the following:—For the best paper on the improvement of the apparatus for washing linen, 4,000 frs.; on the best means of preserving corn in farms and granaries, 4,000 frs.; on the best means of purifying corn attacked by insects and infected with mildew, 1,500 frs.; on the manufacture of economical candles, 4,000 frs.; and on the means of establishing large ice-houses in places where there are none at present, silver medals.

M. Jaubert, the Minister of Public Works, is about to adopt a plan long since recommended by the Academy of Sciences and the Geographical Society. The principal engineers of roads and bridges in all the departments of France, are to be provided with barometers adapted for the measureing of heights. This plan will be the means of furnishing valuable information respecting the elevation of the land in all parts of France, as well as useful data respecting the climate of different parts of the country.

The commissioners appointed by the Minister of War to ascertain the quantity of air necessary for the respiration of one horse, have reported as follows: "We are of opinion that in a stable where the air is renewed by proper openings in the doors and windows, and still more when a plan of ventilation is skilfully arranged, a horse will never be injured from the want of atmospheric oxygen, when the building contains 25 or 30 cubic metres." The metre is equal to one yard and three inches.

BELGIUM.

LINEN MANUFACTURES OF BELGIUM.

The Commission of Inquiry into the state of the trade and commerce of Belgium, commenced its labors, it may be remembered, by sending a number of interrogatories to the different chambers of commerce in the country. Answers to those questions have been sent by the chamber of commerce of Liege, to the following effect:—

On the first question, viz., "To consider the present condition of foreign trade in relation to the manufactures and agriculture of the country;" the Chamber of Commerce of Liege are of opinion that unlimited production, both by private manufacturers and by companies authorised by the government, is one of the causes of the glut in the markets. That the difficulty of finding foreign customers for the goods manufactured, arises entirely from the competition to which Belgian produce is exposed in all foreign markets; that the differential duties which it is proposed to establish in favor of the Belgian shipping, in order to increase the number of ships, would not increase the exportation of the Belgian manufactures.

On the second question, "Do the present laws afford sufficient protection?" the Chamber is of opinion that the tariff of 1822 ought to be revised, but that if the object of such revision be only to increase the import duties on foreign goods with the view of limiting the internal consumption of Belgium to goods manufactured in the country, it would be better to let the existing tariff continue, because an increase of import duty would only serve to increase the amount of smuggling.

As to the third question, in case the Chamber should be of opinion that the laws are insufficient; "To draw up the bases of a commercial and naval system which it would be for the good of the nation to establish;" the Chamber observes, that it is easy to conclude from their preceding answers, that their opinion is in favor of a moderate system of free trade.

The Chamber of Commerce at Courtray have arrived at conclusions diametrically opposite to those of the Chamber of Liege. It is stated in the *Nouvelliste de Bruges*, that the commission of commercial inquiry having met in the room where the Chamber of Commerce hold their sittings, the members of the chamber, the burgomaster and others, were examined, and they were unanimous in requiring protection for the hand-loom linen manufactures, by raising the bounties on the export of linens. They were also unanimous in favor of differential duties.

The *Journal des Flanders* states, that the Minister of the Interior, M. Liedts, has, in consequence of the information communicated by the commission of inquiry, determined to adopt measures for the encouragement of the linen manufactures. For this purpose he has had three hundred looms of a new construction manufactured, to be distributed gratuitously to the weavers of Flanders. The wretched state to which the trade has been reduced has prevented the majority of the weavers from procuring looms with the modern improvements, which might enable them to compete with foreign manufacturers. To remedy this evil, the minister intends distributing the improved looms among the manufacturers, so that when they have had practical experience of the advantages to be gained by the new method, they may be induced to supply themselves with the improved machinery at their own cost.

M. Rey, sen., one of the members of the deputation from the commission of inquiry into the state of the linen manufacture, who went to England with the three other members, has returned to Brussels. The Count d'Havre and M. Eugene Desmitt have left Brussels to supply the place of M. Rey. This deputation from the commission, to examine the linen manufactures of England, will return to Belgium the beginning of September.

M. Nothomb, on returning from Carlsruhe, stopped at Manheim, to visit the works of the new port and of the railroad. According to instructions given by the Baden government, the Belgian minister was accompanied by the engineer, Keller. The first portion of the Baden railroad, from Manheim to Heildelburgh, was to be opened on the

29th of August (this day). The post-office administration is to have the management of working it. The Baden government, following the example of the government of Belgium, constructs the railway at the expense of the state. The road is wider than those of the Belgian railroads, and the rails are laid down upon logs of wood, placed lengthways instead of transversely. The plan adopted seems to be the same as that on the Great Western Railroad in England.

RAILWAY INTELLIGENCE, DOMESTIC AND FOREIGN.

The Late Appalling Accident on the Eastern Counties Railway.—The serious calamity that occurred on this railway, on Thursday s'ennight, as recorded in our last, has been the topic of general conversation. So great has been the alarm created, that the average traffic on the line has, we are assured, greatly diminished; and the Cambridge coaches have been removed from the railway, resuming their former route by the road. Mr. Ebsworth, Mr. Austin, and Foster, the driver of the engine, have expired since our last. Several individuals are still lingering, and several others, we rejoice to say, are in a fair way of recovery. The inquest has been conducted with the most praiseworthy anxiety on the part of the jury; who have investigated, thoroughly, every thing and every person that could throw a light on the disastrous occurrence. On Wednesday the whole of the evidence having been gone through, the Coroner observed that he had received an anonymous letter, to which he was not disposed to pay much attention; but it stated that Mr. Braithwaite had said that he would not hesitate to go 60 miles an hour on this railway. He wished to know if that was the fact?

Mr. Braithwaite observed, that he had often said so, and would not hesitate to go down the incline at 60 miles an hour, taking care to be ready, if requisite, to shut off the steam; but the instructions to the drivers were not to go beyond 30 miles an hour on the railway. If they lost time, they were not even allowed to bring it up. THE ACCIDENT WAS ENTIRELY OCCASIONED BY THE EXCESSIVE SPEED OF THE ENGINE, WHICH WOULD BY ITS OWN GRAVITY GO DOWN THE INCLINE AT THE RATE OF 23 OR 25 MILES AN HOUR. WHEN TO THIS WAS ADDED THE POWER OF STEAM, THE SPEED COULD NOT HAVE BEEN LESS THAN 60 MILES AN HOUR. IF HE HAD SHUT OFF THE STEAM, IN TIME, THE ACCIDENT COULD NOT HAVE HAPPENED. IT WAS ENTIRELY OCCASIONED BY OVER-DRIVING.

The Coroner then proceeded to sum up. The jury, he said, would dismiss from their minds all rumors, and attend solely to the evidence that had been given. He need not remind them of the importance of the inquiry—important alike to the relatives of the sufferers, to the proprietors of the railway, and to the public. The question for their consideration was, whether the accident arose from over-driving on the part of Foster, or from some irregularity on the rail over which he had no control. The Coroner then read the evidence, commenting on it as he went on. If the jury were satisfied the accident arose from gross negligence on the part of Foster, he would be liable, if living, to be indicted for manslaughter, and, although he was dead, the verdict might be the same. The evidence of over-speed certainly preponderated. If the jury thought that such was the cause of the accident, then came the question whether the verdict ought to be coupled with a deodand, or not. In every case of homicide that which actually caused death became deodand, and juries might apportion the deodand according to the circumstances of each particular case. If they awarded no deodand, they must be sure that nothing was wanting to ensure the safety and security of the public.

At ten minutes to one, the jury proceeded to consider their verdict, and returned at twenty minutes past two o'clock with a VERDICT OF "ACCIDENTAL DEATH," with a DEODAND OF £125 IN EACH OF THE CASES, OR £500 IN THE AGGREGATE.

In another part of our Paper, we have offered some observations on Railway Travelling, suggested by this and other recent accidents, to which we direct our readers' attention.

Eastern Counties Railway.—On Thursday afternoon, the eighth general meeting of the proprietors of the above railway was held at the London Tavern, to receive the eighth report of the directors. Henry Bosanquet, Esq., the chairman, was unanimously called on to preside. The chairman, having opened the proceedings with an appropriate speech, called upon Mr. Duncan, the solicitor of the company, to read the report, which was very long, from which it appeared, that since the opening of the line to Brentwood, the traffic had far exceeded their expectations, and that, to complete the whole distance to Colchester, would require a further outlay of £982,726, which was to be obtained by the issuing of new shares. The report concluded, by referring to the late fatal accident on the railway, and the heavy amount of deodand, unaccompanied by the least intimation that they were in any respect culpable; adding, that they had not had that entire support and sympathy from a jury of their countrymen, which they confidently anticipated. The report was subsequently adopted and ordered to be printed. On the motion of Mr. H. F. Atkinson, of Liverpool, seconded by Mr. Saul, it was resolved to proceed forthwith to complete the line to Colchester. A vote of thanks was then given to the chairman and the board of directors, and Mr. Bosanquet having acknowledged the compliment, the meeting separated.

London and Blackwall Railway.—On Thursday, the half-yearly general meeting of the London and Blackwall Railway Company took place at the London Tavern, for the purpose of receiving the report, &c., connected with the above railway. The secretary read the report, which, after referring to the excellent working of the line, set forth that, from the day of its opening, the 6th of July, to the 24th of August, the number of passengers who had travelled by it amounted to 331,351, and the total amount received, to be £5,051 8s.; while the number of persons embarked and disembarked at the Brunswick Wharf had been 60,855, the principal part of whom were from the town of Woolwich, which, by means of the railway, had been brought within 25 minutes' distance from the metropolis. The balance sheet showed the receipts to amount to the sum of £668,068 13s. 1d., and the disbursements to £643,343 10s. 2d., leaving a balance in hand of £24,725 2s. 11d. The report concluded by stating that, in order to be prepared for payment of property purchased for the extension of the line to Fenchurch-street, a call of £2 10s. per share would be necessary before the end of the year. The report was then adopted.

Birmingham and Gloucester Railway.—The additions in progress for the safety and accommodation of the public, at the Lansdowne station of the Birmingham and Gloucester Railway, are proceeding with vigor. A new hotel is to be immediately erected opposite the station gates in the Queen's Road, and workmen have already commenced excavating for the foundation.—*Cheltenham Looker-on.*

Birmingham and Gloucester Railway. Another Diabolical Attempt to Destroy Life.—Some miscreant has again been attempting the destruction of lives and property, by placing stones on the Birmingham and Gloucester railway, between Spetchley and Norton. A reward of £5 has been offered for the detection of the offender. It appears by the handbill, that the outrage was perpetrated on the very same night as that spoken of in our last, when a man named Williams laid a bar and a piece of timber on the rails, for which he was fined £10. —*Worcester Herald.*

Great Western Railway.—We have just been given to understand, that the opening of the line to Bath is definitively fixed for Monday, the 31st of August. Several experimental trips have been made during the last few days, in all cases attended with a successful result.—*Bristol Standard.*

Great Western Railway.—A report is prevalent in town, that this company will want to raise £700,000 more, to complete their works.

London and Ramsgate Railway.—We observe, with pleasure, that Mr. Walter has proposed a new line of railroad from London to Ramsgate We have received a prospectus, which we shall notice on a future occasion.

New Line of Railway to York.—We have heard that before long measures will be taken to bring forward the line which was planned under the late Mr. Cundy, and surveyed by Mr. Walker, across the fens of Lincolnshire to York. The saving of distance to the north, by this line, will be very great, while, perhaps, it will, for levelness and cheapness of construction, surpass any line in the kingdom. We are informed also that the traffic upon it, especially in agricultural produce, will be unusually large. If this line should be carried, as no doubt ultimately it will, nearly the whole of the traffic to Scotland from the metropolis will pass by it; and hence the necessity, as we have said before, of having the line to Edinburgh made somewhere between Carlisle and Newcastle. If it start from either side of the country alone, it will be most unjust and injurious to the other. It is not so much the interest of Scotland, as the interest of England in this Scotch line, which is to be considered, and this can only be properly and fairly consulted by making two lines, an east and a west, or one which shall answer the purpose of two. Now we believe the country will not support two, therefore it will be advisable to make the one in such a position that it shall be the most available for both sides of the country.—*Railway Mag.*

London and Manchester Railway.—It appears, by the advertisements in another part of our journal, that the projectors of this undertaking are determined to make no plaything of their line. A list has been shown us of 49 or 50 of the first houses in London, connected with the Manchester trade, who have signed the following declaration, namely—"We, the undersigned, being interested in the trade between London and Manchester, are of opinion that a new line of railway is necessary for the conveyance of passengers and goods between the above towns."—*Railway Magazine.*

Advantages of the Hull and Selby Railway. —Previous to the opening of the Hull and Selby Railway, in going from Hull to Matlock, persons had to leave by the Doncaster mail at 4½ in the morning, then proceed by the North Midland Railway to the Amber-gate Station, where the omnibuses met the train, and arrived at Matlock about 5½ or 6 in the evening, and which cost about £1 14s. Now parties may leave Hull by the 2 o'clock train, and arrive at Matlock before 8 o'clock, at the small fare of 17s.; thus saving half the expense, besides avoiding the unpleasantness of rising so very early in the morning.—*Hull Advertiser.*

Bristol and Exeter Railway.—We understand that the lease of the Bristol and Exeter line to the Great Western Company has been signed, subject to the confirmation of the general meeting of the Great Western Company, which will be held on the 29th inst. (this day), and of the Bristol and Exeter on the 2d of September. The laggard progress of our line has damped the energies of railway speculators, and materially depreciated the interests of the shareholders—we believe that it has tended to inflict a heavy blow and great discouragement on our fair city, in the inevitable necessity which appeared to exist of stopping some years at Taunton. This for a long time would have been the terminus had not more vigorous steps been taken to give increased vitality to the company. In the course of next summer the Great Western Line will be opened throughout—

the railroad will then be continuous to Bridgwater —which will bring Exeter within an easy twelve hours of London.—*Western Times.*

Newcastle and Carlisle Railway.—On Saturday evening last, as the Newcastle and Carlisle Railway train was approaching Stocksfield, an accident occurred, by which the engineman, Oswald Gardiner, a valuable servant of the company, lost his life. An inquest was held on Monday before Mr. Stephen Reed, coroner, when it appeared in evidence that the connecting rod of the engine having broken, the fragment forced itself into the boiler and fire-box, just as the fireman opened the door to renew the fuel. The steam forced out the cinders, ashes, and water, so as to cover the men and burn them. The fireman had the presence of mind to climb over the tender and luggage carriage, and so escaped with some severe, but not dangerous burns. Gardiner, the engineman, unfortunately endeavored to save himself by jumping from the engine, after it had proceeded nearly 80 yards from the point where the accident first happened, and received a concussion of the brain, from which he never rallied, and of which he died about two o'clock on Sunday. Mr. Wallace, surgeon, of Shields, was on the train, and not only gave his professional aid, but at considerable personal inconvenience remained with the unfortunate man to near the time of his death. The company sent a medical man from Newcastle, and another from Corbidge, but their efforts were in vain. The jury returned a verdict of "Accidental death," with a deodand of 5s. on the engine.—*Carlisle Patriot.*

Another Railway Accident.—We hear that, on Friday last, two of the carriages of one of the trains proceeding from York to Leeds were overturned near the junction of the York with the Selby Railway. Fortunately the connecting chain broke, and thus prevented the engine from dragging the carriages along, and set it at liberty to proceed a little way without the train. Several passengers were in the overthrown carriages, but none of them were injured beyond the effects of a severe shock. We understand the two carriages were so much damaged that they were obliged to be left, the engine proceeding with the rest of the train, in which all the passengers were brought in safety to Leeds.—*Leeds Times.*

Conviction for Throwing at a Train on the Great Western Railway.—On Tuesday a person of respectable appearance, named *Thomas Benn*, appeared before Colonel Clitherow, Rev. Dr. Walmsley, and Messrs. G. Baillie and H. Pownall, the sitting magistrates, to answer a charge preferred against him by Mr. Fred. Field Whitehurst, the superintendent at the Ealing station on the Great Western Railway, of having thrown a packet containing mushrooms at the passengers of one of the trains on the 18th instant, whereby he had incurred a penalty of not exceeding £5. The Bench said a stop must be put to such proceedings, which might be productive of most serious consequences. As, however, it was the first case brought before them, and in the hope that it would operate as a warning to others, they would mitigate the fine to 10s., and 5s. costs, which the defendant paid.

Glasgow, Paisley, and Greenock Railway.—We are happy to learn, that provided the weather permits, the Directors of the Glasgow, Paisley, and Greenock Railway, intend to open the line between Port-Glasgow and this on the 1st of September. We have also heard it rumored, and we believe the report to be correct, that it is the intention of the directors to open the whole line next month. Only a mile will then remain to be finished at Bishoptown, and this little gap can easily be done by omnibus in seven minutes.—*Greenock Advertiser.*

Aryshire Railway.—In consequence of the opening throughout of the Aryshire Railway, Glasgow is now placed within twenty-four hours' distance of London, and the directors of the company, by the recent purchase of the *Fire King* steam-ship, which is to run three times a week from Ardrossan to Liverpool, have pretty nearly *secured* this line of communication. The train leaves Glasgow at 4 p.m. in time for the steamer from Ardrossan at six, which in thirteen hours will be in Liverpool, so as to meet the southern trains which bring the passengers in nine hours to the metropolis.—*Railway Times.*

Charges of Railway Companies.—In the Court of Chancery, the Lord Chancellor lately pronounced a decision, in the case of an information against the Derby and Birmingham Junction Railway Company, to compel them to charge one uniform price for the conveyance of all who pass along their line of railway. The information was filed under the authority of the 63d section of an act passed in June last, for amending the act under which the company took its powers. By that section it was provided, that the company must charge the same price for all goods and passengers passing along their line in the same carriage, over the same ground, and under the same circumstances. The complaint against the Derby Company was, that they charge only two shillings for persons passing along their line to go by the Birmingham Railway on to London, but that they charge eight shillings if they are not going to London. The Lord Chancellor observed, that the case made for the relators was founded on a most erroneous view of the meaning of the section of the act of Parliament. That section was framed to prevent the directors of railroads from showing any preference in the conveyance of goods and merchandise to the injury of rival carriers; and this was clear from the latter part of it, which prohibited them from taking more or less from any person going over the same line. As the information was an attempt it was desirable not to see renewed, his Lordship dismissed it with costs.

COLLEGE FOR CIVIL ENGINEERS.

This Institution, a detailed report of the opening of which appeared in this Journal, was re-opened on Friday, the 13th instant, at the premises lately purchased by the council, at Putney.

The council assembled to receive the students on their return to college, when the officers, professors, and the students, being congregated in the large banquetting hall of the mansion, the Earl of Devon took the chair.

His Lordship, on rising, stated, that as on the opening of the college he had hastened by railroad to be present at the ceremonial which then took place, so now on the re-opening he had delayed a journey by railroad, that he might not be deprived of the pleasure of meeting all present this day. His Lordship expressed the sincere interest which he took in the undertaking, and his conviction that the institution would become the best seminary for youth not destined for one of the learned professions,—the first scholastic establishment in this country, saving the universities. The education provided by the college, though avowedly for those intended for the profession of the civil engineer, may be pursued by youth in general with infinite advantage; more particularly in these days of emigration, when a young man may be unexpectedly thrown into a new colony—when he must be entirely dependent upon his own resources, and when he would find such a practical education as the college affords of infinite value. His Lordship concluded by saying, that the council had in contemplation many things for the well-being and encouragement of the students, and mentioned, inter alia, the founding of "travelling fellowships;" he added, the council would indeed leave nothing on their part undone, and he was convinced that the patronage of the public would be amply bestowed upon the undertaking.

Berkley Westropp, Esq., as an old sailor, drew the attention of the students to the dangers which are attendant upon boating by inexperienced hands, and expressed his hope, his belief, that the students would strictly and cheerfully comply with those regulations which the council, not intending to deprive them of the healthful exercise of rowing, but to guard them from its dangers, would shortly promulgate.

Nathaniel Ogle, Esq., in a very eloquent speech, sketched historically the march of education from the primitive ages, and showed that the course of instruction to be pursued in the college is adapted to the age in which we live. He called upon the young men to bear in mind, that the profession for which they are destined is of a high and ennobling character—and he hoped that they would qualify themselves for the successful and honorable pursuit of it by diligent attention. He entreated them to remember also, that to be happy, they must not only be good scholars, but Christians and gentlemen. He entreated them to make good use of the advice and instruction of their excellent chaplain. He told them that they were received, would be treated, and were expected to conduct themselves as gentlemen. He concluded by observing, that the council would omit nothing that might tend to make them comfortable and happy, and by reminding them that they would best evince their gratitude by making good use of the advantages offered to them.

The Resident Director, Col. Hutchinson, read a code of regulations, providing for the discipline of the establishment.

The Earl of Devon commented on the same, and stated that the council would make provision for both bathing and swimming, and that a suitable cricket ground had already been marked out. His Lordship said, that, as an old cricketer, he had on first visiting the premises naturally looked out for a good ground—a suitable one had been found, and he promised on his return to town to pay a visit to the college, not to take a part in, but to act as umpire in a cricket match.

Berkley Westropp, Esq., after passing an encomium upon the noble earl for his unwearied attention to the interests of the undertaking, proposed a vote of thanks to his Lordship, which was carried by acclamation.

The working model of a locomotive engine, and a series of beautifully-executed drawings of railway carriages, the work of one of the students during the recess, were exhibited to the company, who in due time adjourned to partake of an elegant collation provided by the Resident Director.

While noticing the proceedings of the institution, we may mention that the new premises purchased are freehold, and consist of two mansions and grounds, known as "Putney House," and the "Cedars," and previously to the purchase the respective properties of Lord Harrington and his brother Colonel Leicester Stanhope. They are situate on the south bank of the river, eastward of the bridge.

The council have acted wisely in selecting this spot, for independently of the capabilities of the buildings and grounds, the locale affords peculiar facilities for effectively prosecuting the course of practical instruction—the most important, and the distinguishing feature in the system of education pursued in the college. The position on the river gives easy access to the numerous public and private works on either bank of the Thames, and also every means of affording to the students *bonâ fide* practice in all that concerns the management of water, and the erection of works connected therewith. The council have evinced their intention of making good use of the opportunities afforded, by appointing to the superintendence of the practical department, a civil engineer of many years' practical experience. The buildings are singularly adapted for the purposes of the college, and extensive additions are under the consideration of the council, so that there may be every accommodation for the extended plan of operations contemplated by the founders. The grounds being twenty acres in extent, there is ample room for recreation grounds, and also for the erection of workshops without

causing annoyance to the rest of the establishment. The *ensemble* of the place is agreeable; the mansion being quite collegiate in its appearance, and the grounds highly ornamental.

GRATUITOUS COPIES

of our Journal have been forwarded to a number of Individuals interested in some Patent, or Invention, of which notice has been taken in our number of to-day.

TO CORRESPONDENTS.

"E. W."—*It expired on the 25th of July.*

"W. Jarvis."—*The list appears in our paper of to-day. It is only published once a month.*

"J. Taylor."—*There can be no doubt of its being an infringement.*

"Mr. Carstairs'" *volume has been received, and shall be noticed in our next.*

Our usual article on THE DRAMA *has been omitted this week, in consequence of a heavy pressure of matter of more immediate interest.*

"G. B.," Hanley.—*Thanks; the article shall appear next week.*

TO INVENTORS.

ALL PERSONS who may be desirous of TAKING OUT PATENTS, or of bringing VALUABLE INVENTIONS into USE, are requested to APPLY to the PROPRIETORS of "THE INVENTORS' ADVOCATE," (DELIANSON CLARK & CO.) at their "PATENT AGENCY OFFICE FOR ALL COUNTRIES," 39, CHANCERY LANE, where they may be consulted, daily, relative to the PATENT LAWS of GREAT BRITAIN, and ALL OTHER STATES.—(See ADVERTISEMENT on the last page of the present Number.)

THE

INVENTORS' ADVOCATE,

AND

JOURNAL OF INDUSTRY.

SATURDAY, AUGUST 29, 1840.

It is essential to a clear comprehension of the scope and bearing of the corn laws, and of the effects which they produce, to remove all those extraneous adjuncts to the subject which have hitherto obscured it. Every attempt to cut away the fringes which hide its real form, and to hew down the prejudices which surround the question, deserves to be hailed as a public good. In this point of view, we regard a pamphlet recently written by Mr. J. P. Westhead, of Manchester, in the form of a letter to Sir Robert Peel, on the Corn Laws.

In this letter he attacks, very successfully, some of the prejudices which have frequently been advanced as arguments against the free trade in corn. He first deals with the alarmists, who apprehend that if we depend on other countries for a supply of corn we shall be starved to death, by a general combination of all nations to produce that effect; he next shows, that the special claim to protection which is demanded on behalf of the agriculturists, on the ground of special taxation, has really no foundation; and he afterwards proceeds to show, that the landed property of the kingdom does not equal in value that employed in manufactures and commerce.

The first of these prejudices is most deserving of consideration, from the influence it appears to exercise on the judgments of men whose opinions have great weight. The danger of depending on foreign nations for a supply of food, which they might, by possibility, at any time combine to refuse, is one of the objections which seems principally to influence the Duke of Wellington in his decision against altering the existing system. Now, the fact is, that all civilised nations must be, more or less, reciprocally dependent on each other for the supplies of the necessaries and conveniences of life. This reciprocal dependence is the very principle on which the intercourse between foreign nations exists; and whether the commodity we require be food, or the raw materials of manufacture, or whether we require a vent for the sale of our wares when manufactured,—in either case, the one want is little less important than the other, as regards national prosperity, and even as regards the means of subsistence.

We have, on a former occasion, pointed out the absurdity of making the dependence on foreign nations an objection to free trade in an article which can be procured from every quarter of the globe, whilst the dependence on one nation alone for the supply of the raw material of one of our principal manufactures, is passed over with unconcern. This point is very forcibly dwelt on by Mr. Westhead, and we cannot now do better than state the position in his own words:—

"The supporters of the present system insist that the horrors of famine would most probably be experienced, were we to rely upon foreign markets; or even a partial war might occasion a stoppage of supplies. Are their fears thus great, then as the argument really stands, how much more painful would their apprehension be, did they feel assured that, instead of looking to *many* regions of the earth for the prime requisite of life, there was admittedly only one country from which he could hope to receive it? Their fears would then amount to terror. What! place the very existence of our population upon a single cast! Language would afford no terms sufficiently energetic to characterise the insane conduct of the Anti-Corn Law men; and solitary confinement, or the restriction of a strait jacket, would be the only remedy for the infatuated and suicidal manufacturer. To you then, Sir Robert, and to all the famine-fearing friends of the improvident mercantile men of Britain, be it known, that despite their forecast and prudence, we are at this moment in a position of dependence upon a foreign land; dependence all but absolute; dependence more complete than it is rational to suppose we could even experience as respects the article of corn: nor is the dependence of which I speak that of a day or a year; it has been endured for many years, and it is at this hour greater than it has ever been. From the United States of America, we receive 350,000,000 pounds of cotton annually. America is the cotton merchant, England the manufacturer. What if America were to withhold her produce, lock up her stores, lay waste her plantations, and consign her fleet to ruin: what if for envy of England, and desire to spoil her pre-eminence, she were thus to act? The stock of cotton in this country does not now exceed the consumption of a few weeks, and should America adopt a measure, such as I have adverted to, where then would be the means of subsistence for more than a sixth part of the population of England? Check the supply of cotton from the United States, and two millions of our people will immediately be destitute of employment, destitute of wages, and destitute of bread."

It is indeed curious, that this important fact should be overlooked by those who urge the dependence on foreign nations as an argument against a relaxation of the existing Corn Law. But even as the case now stands, we are dependent upon foreigners for a great portion of our regular supply of corn; and the question, after all, becomes merely one of degree; for if the deficiency of the home-grown supply were not to be made up by importations from abroad, corn in this country would soon reach a famine price.

The second branch of the subject which Mr. Westhead considers, is the relative proportion of the taxes paid exclusively by the landed proprietors and by manufacturers. The charge to which the former are exclusively liable, is the land-tax, which in 1838 amounted to £1,198,991. The other charge which the agriculturists complain of as pressing upon them, is the rate for the relief of the poor, and the county rate; which, in 1832, amounted together to £8,606,500. It must be borne in mind, however, that the manufacturers contribute largely towards paying the latter charge; and against that portion of taxation which is especially borne by the agriculturists, Mr. Westhead places the taxes paid exclusively by trade and manufactures; which more than balance the exclusive bur-

dens of the landlords. The revenue derived from bills of exchange, from probates and legacies, from marine and fire insurances, from the post-office and from paper, amounted in 1836 to £6,648,395; of which, he says, the proportion contributed by the landowners was but as dust in the balance.

This charge on trade and commerce, Mr. Westhead observes, forms a handsome set-off against the notable land tax. But, he continues,—

"I will not, however, allow the argument to rest here. Do the agriculturists vaunt themselves on being our best customers? I retort, we manufacturers are not merely your best and only customers, but we are at the same time the best and cheapest producers. We supply to you all the main articles of necessity, comfort, and taste, at a cost far below that at which they are elsewhere attainable; and the case stands simply thus, we who are compelled by law to purchase our corn in the dearest market in the world, are the parties, who by our united energy, toil, and capital, have rendered England the cheapest market to which the English farmer can resort; in other words, we have, contrary to all precedents, created the cheapest mart for manufactures in the dearest provision market in the world."

The third branch of the subject, on which Mr. Westhead dilates at some length, is the comparative value of the whole of the landed and of the personal property in the kingdom. He makes it appear, from various estimates and calculations, that the extreme value of the landed property in England and Wales is £1,020,000,000, and that of the personal property is £1,950,000,000, leaving an excess of personal above real property of £930,500,000. This latter consideration is not, however, of much moment; for the importance of our manufactures and the immense wealth employed in trade and commerce is no longer disputed in any quarter; and comparisons of the relative importance of agriculture and manufactures only tend to keep up the feeling of rivalry and opposition which it is most desirable should be removed, in order to come to a satisfactory adjustment of the corn law question.

Mr. Westhead is a manufacturer, and takes the manufacturers' view of the subject. It would appear from his general remarks, that he advocates an unrestricted trade in corn. We cannot go with him to that extent, because, in our opinion, the agriculturist does at present require some protection to place him on an equal footing with the foreign grower, and any change which would be seriously injurious to the landowners and farmers, would react on the manufacturers themselves, with nearly equal effect. The statements and reasonings which Mr. Westhead's pamphlet contains, are, however, valuable, as we before observed, seeing that they tend to remove some of the prejudices which now incumber the subject of the corn laws, and prevent it from being wisely considered.

INSECURITY OF RAILWAY TRAVELLING.

The recent accidents on the Hull and Selby, and on the Eastern Counties Railways, must not be permitted to pass without comment from us. Had accidents, attended with such fearful loss of life, occurring so soon after each other, taken place at an earlier period in the history of railways, they would have had a serious effect on those undertakings. Even now, after several years' experience of the great facilities those means of conveyance afford with comparatively little danger, these accidents will tend to shake the feeling of confidence in them which was almost established. The personal injuries which had previously been sustained, when the engines were thrown off the rails, were almost entirely confined to the engineers and persons connected with the management of the trains, and the rare circumstance of a passenger receiving injury from the overturn of the carriages had engendered a feeling of confidence in the public, and we fear it had produced, at the same time, a degree of carelessness on the part of the conductors of the trains. These late accidents will serve as serious cautions for some time to come, that the means at present in use, for the safety of the passengers, be carried into effect; but they should also serve to rouse attention to the question, whether those means are, even when fully executed, adequate to afford the utmost degree of security which might be obtained.

The subject may be considered in two separate divisions; first, as regards the machinery employed; and secondly, as regards the means of working it.

With respect to the former, we are of opinion that there is still great room for improvement, and it has always appeared to us that the flanches of the wheels, which guide the engines and carriages on the rails, are much too narrow. This fact is, indeed, self-evident from the frequency of the engines getting off the rails; but as no serious accident had until lately occurred to the passengers, it seems to have been thought unnecessary to make any alteration. The rapidity with which the engines and carriages are propelled, renders them liable to be easily thrown off the rails by a small obstacle, and the flanches at present employed seem only fitted for railroads in the most perfect state of repair, and free from all impediment.

The objection to increasing the flanches is, that it would increase the friction; but even were that the case, the additional security to the passengers to be afforded by it should overweigh all other considerations. We have no doubt, however, that the additional security might be easily obtained without any mechanical disadvantage, if our engineers were to pay attention to the subject. There might, for instance, be guard-flanches fixed to the wheels, which need never rub against the rails excepting when the carriages would otherwise be thrown off. The absence of all precaution of this kind can only be accounted for by the fortunate chances that have, until the last month, attended the running of the trains. Any one who contemplates the constant hazards to which a railway train of carriages is exposed, especially where the rails are undergoing repair, must be astonished that with so trifling a guide as the flanches at present used afford, the carriages can ever run a long journey without being at some point or other thrown off the rails. To this subject the attention of engineers and of railway managers ought to be at once directed, for it has now been shown by fatal experience that the present rails and wheels are unsafe.

Next, as regards the means of working the railway machinery at present in use. We have, on more than one occasion, urged the importance of employing a superior class of men to those who are now entrusted with the management of the trains and engines. It appears from the evidence given at the inquest on the bodies of the persons killed on the Eastern Counties Railway, that the guard was at the time of the accident sitting with his back to the engine; and the guard on the Selby Railroad was absent from his seat, and was acting as check-taker, when the carriages were overturned. In the case of the Eastern Counties Railway, also, there seems to be no doubt that the loss of life was occasioned by the recklessness of the engineer, Foster. It seems surprising, that in a country like this, where so much pains are in most cases taken to prevent personal injury, the lives of so many passengers should be daily entrusted to the charge of a class of men but little removed above that of a common laborer. The Act of Parliament passed last session for the regulation of railways, provides, in many respects, for the protection of passengers, but it fails to touch upon the points which appear to us to be most essential for the safety of the public.

NEW INVENTIONS.

NEW DISCOVERY CONNECTED WITH NAVAL WARFARE.

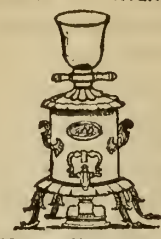
In the "*Times*" of Thursday is a leading article, directing especial attention to what the writer calls "certain discoveries which are likely to alter the aspect of war all over the globe, and vest the dominion of the seas in the power that possesses the secret." It appears that the inventor, a seafaring man, who had from his earliest years been practically conversant with naval gunnery in all its branches, has made discoveries involving the annihilation of every known system of naval warfare. These were made known to His Majesty, William IV., who saw and conversed with the projector, and referred him to the late Sir Richard Keates and Sir Thomas Hardy. Sir Richard Keates, in company with a naval officer of 40 years' service, yet alive, who fought at Trafalgar, and was the companion of Sir Sidney Smith in most of his exploits in Egypt, and therefore no likely person to underrate the powers of the British navy, witnessed some experiments, and afterwards reported to His Majesty that no ship in his navy, nor any garrison on shore, could resist this stupendous combination of forces. It was instantly agreed that the inventor should be remunerated amply for his pains, and the secret be preserved, in mercy to mankind, until some crisis should occur to compel England, for her own safety, to resort to its use. Before the necessary arrangements could be completed, however, King William died. A short time afterwards, when application was made for the completion of the contract, a variety of excuses were put forth, further trials demanded, and a stipulation made that an unconditional disclosure should take place before the Lords of the Admiralty. The projector, who had expended in perfecting his inventions upwards of £35,000, and had involved himself in the most distressing embarrassments in consequence, very naturally refused, remembering how easily the Spanish courtiers could make an egg stand upright when Columbus had shown them the way, and how small was their gratitude for the lesson. But he offered repeatedly to submit his discoveries to any three efficient naval officers, and to abide by their report. Still, however, the inventor was kept under the tortures of suspense for upwards of two years, and at last, when he applied for a small advance of money, he received for answer, that "the Government could not authorise the payment of any sum of money whatever in the present state of circumstances."

When the projector found all his offers of submitting his inventions to the inspection of the officers before alluded to, rejected or evaded, he put himself to the great cost of exhibiting some of them to four very competent judges, who witnessed a trial of them on the 28th of last month. The report made by these gentlemen was highly favorable to the inventions, and Government was fully aware of their importance. Still, however, no offer is made for the discovery, which, as the *Times* properly observes, "might have been retained as a close state secret, and our navy might still have existed; but now that the inventor is compelled to go abroad, or appeal publicly to his countrymen, the destruction of our wooden walls by a foreign foe, or its disuse by ourselves, is inevitable, for John Bull will not submit to pay hundreds of thousands of pounds to build a ship which at three miles' distance may be sent into fragments in a moment."

A NEW BUTTON.

The manufacture of buttons has at length reached the *ne plus ultra* of perfection. An ingenious Frenchman has invented a button, in which the principle of nut and screw is applied, so that, without a stitch, buttons may be far more securely, as well as more speedily, put upon clothes than in the ordinary way; and those who have not souls above buttons, may, if they please, have half-a-dozen suits of buttons to each suit of clothes, the top being screwed on to the shank.—*Birmingham Advertiser.*

PLATOW'S PATENT



AUTOMATON COFFEE URN

All persons who are fond of coffee—and coffee is now become a very favorite beverage in England—will readily allow that there is a considerable degree of *art* necessary to manufacture it *comme il faut*.

According to the valuable researches of Dr. Donovan (author of "Domestic Chemistry" in '*Lardner's Cyclopædia*,') coffee contains two principles,—one, highly volatile, which gives to it its peculiar aromatic favor, and a pungent and exhilirating principle of a fixed nature. Hence arises the first difficulty in "making" it properly.

If the coffee is boiled too long, the volatile aroma evaporates; if it has not boiled long enough, the pungent or stimulating principle is not sufficiently extracted.

The *clearing* of coffee is, to delicate palates, a matter of as much importance as boiling it aright. To effect this, two plans have been adopted,—clearing by isinglass and other substances (which separate the coarser particles by a chemical action), and the Percolator invented by Count Rumford, which is nothing more than a strainer by which the coffee liquor is separated from the grounds. In *this* instrument, coffee is placed on the filter, and hot water *poured upon it*, which, forcing its way through the filter, carries with it an infusion into a vessel or urn below.

This plan is objectionable, inasmuch as the coffee *is not boiled*, but merely subjected, like tea, to infusion. Thereby its *strength* is not extracted, and the liquid becomes cooled by the process.

The dilemmas which beset the worthy housewife in this branch of her art being understood, the object of Mr. Platow's invention will be better comprehended. We annex an engraving of the apparatus, and also the directions for its use. They are simple, and perfectly intelligible to the meanest capacity.

Screw the vase tight, and pour into it as much boiling water as you desire to produce coffee; slacken the screw, and the water will descend into the urn; then tighten the screw, and introduce the lamp underneath, and place the proper quantity of coffee upon the filter, which is inserted near the bottom of the vase.

In a short time, the boiling water will be forced up by the elastic pressure of the steam, into the glass vase, and boil the coffee.

In a minute or two the operation will be complete.

Then withdraw the lamp, when the steam in the urn will condense, and the coffee will descend through the filter into the urn in a highly clarified state.

On loosening the screw, the coffee may be drawn off for use.

It is requisite that the glass and urn should be heated before the boiling water is applied. This may be done, by first passing through them a cupful of warm water, which, if of a moderate heat, has the additional effect of rendering the glass less liable to break from the sudden change caused by pouring boiling water into it when in a perfectly cold state.

To the above, we consider it necessary to add a few remarks.

First, with respect to the difficulty of boiling the coffee sufficiently long to extract the stimulating principle without wholly dissipating the volatile aroma. As the boiling process does not begin until the water rises into the urn, the very moment of its commencement can be *ascertained*, and the boiling *graduated* as to time, with perfect precision by a watch. Moreover, in the common coffee-pot, the coffee is apt to be badly prepared, not only by irregularities in *the time* of boiling, but by the *variations of temperature* to which it is exposed on a common fire. But as the water forced up into the vase of Platow's Urn, is remote from the source of that (the fire), the temperature is more equable and more moderate than that of boiling water in partially closed vessels, (this we have proved by the thermometer.) The French, who are adepts in coffee making, *simmer* it, or expose it to a temperature a few degrees below the boiling point.

Secondly,—As to the *clearing* or *fining* of coffee,—it must be obvious, that the atmospheric pressure drives the coffee liquor through the filter with more force than it passes through the percolator, and therefore fines it with a rapidity that does not allow of its cooling in the descent; and as the coffee is thoroughly boiled before it is filtered, there is no waste of strength as in the percolator. By the principle here adopted, the inventor unites the various *desiderata* in coffee making,—viz., aroma, strength, and heat.

IMPROVEMENTS IN THE DAGUERREOTYPE.

An important improvement has been made in the appearance of the images presented by the Daguerreotype. It was stated, at a recent sitting of the Academy of Sciences, at Paris, that M. Fiseau has succeeded in diminishing the shining appearance of the plate, which has hitherto greatly spoiled the effect of the picture. By adding a small proportion of chloride of gold to the solution of hyposulphate of soda, into which the plates, are plunged for the purpose of washing them the surface of the silvered plate, by its combination with the chloride of gold, becomes brown; and by this means the shadows are darkened, whilst the lighter parts formed by the mercury become more bright and prominent. This is described as being a very decided improvement in the photogenic art.

BUSTS MADE BY THE ELECTROTYPE PROCESS.

The electrotypic method of taking copies in copper of medals and coins, has been applied with success to taking complete busts and statues. Messrs. Soyer and Ingè, of Paris, have succeeded in effecting the deposition of copper, by a current of galvanic electricity on the *entire surface of busts and statues*. There appear to be no limits to the extent to which this beautiful application of electrical power in disturbing the affinities of substances in solution, first introduced by M. Jacobi, may be carried; for Messrs. Soyer and Ingé undertake to coat with copper the largest statues as well as the smallest: even the immense elephant on the site of the Bastile, is not too large for them.

GAS FIREWORKS.

A Brussels paper, the *Fanal*, mentions some curious experiments that have been performed by a scientific gentleman in that city for, the purpose of imitating the appearance of fiery meteors and shooting stars, which may be considered the first steps towards the construction of gas rockets and fireworks. He entertained the opinion, that, in a perfectly calm atmosphere, carburetted hydrogen gas, or any other gas lighter than the air, would rise in the same manner and form as smoke from a taper. To make the gas visible, he mixed it in a vessel with some tobacco smoke, and then he permitted it to escape through a small opening. The gas is thus easily seen rising through the air like smoke; and when it is set on fire, the ignition of the gas takes place along the lines of its progress in the air, presenting the appearance of small meteors, and of fireworks of various kinds, which have a very curious and pleasing effect.

IMPROVED MODE OF COLORING MARBLE.

The art of coloring marbles, so as give them the richest and most beautiful tints, has been recently carried to great perfection in Italy, by M. Ciceri. A Verona journal gives the following account of the methods adopted to produce different colors. A solution of nitrate of silver penetrates into the marble, and produces a deep red color. A solution of nitrate of gold penetrates about the twelfth part of an inch; it gives a beautiful violet-purple color to the marble. A solution of verdigris gives a clear green color; solutions of dragon's-blood, also penetrate marble; giving it a beautiful red color. Marble is penetrated to a considerable thickness by all alcoholic tinctures of coloring woods, such as Brazil-wood, Campechy, &c. The alcoholic tincture of cochenille, mixed with a little alum, produces a very beautiful bright color, which penetrates far into the marble, and makes it resemble the red marble of Africa. Orpiment dissolved in ammonia, quickly dyes marble a yellow color, which becomes more vivid the longer it is exposed to the air. The solvent which causes the coloring matters to penetrate farthest into the marble, is wax. Verdigris, which has been boiled in wax, and applied to marble quite hot, penetrates to the extent of nearly half an inch, and produces a fine emerald color. Several precautions and methods are stated, for the purpose of preventing the colors from mixing, where many are used at the same time for the purpose of producing any required patterns.

VARIETIES.

Velocity of Travelling.—The system of travelling is now so much improved, that, persons can travel from Paris to London, *via* Dieppe, in 27 hours, and can get down to Leicester in five hours more, making in all 32 hours. Ten years ago, they were 36 hours in going from Calais to Paris. —*Leicester Journal.*

The Census of 1841.—By an act which recently received the Royal assent, for taking the decennial account of the population, the whole census is to be conducted by the Registrar-General and one or more commissioners, to be appointed for the purpose, who are to prepare the necessary forms, and direct and control the persons employed. In England, the registrars are to superintend the inquiry, and they will divide their districts into sections of a convenient size, appointing to each a qualified enumerator, who is to be approved of by the superintendent registrar. These enumerators are to take an account of the name, sex, age, and occupation of every person in their district, and to ascertain whether they were born in the parish or county; also of the houses inhabited, building, and uninhabited, distinguishing all places of religious worship. These returns, when examined by the registrars and superintendent registrars, are to be forwarded to the commissioners for the purpose of arrangement and abstract. The attempt at first proposed to obtain a valuation of property is abandoned. It will be seen that the officers employed will be all under one control, acting upon an uniform system, and qualified by their previous occupations, or selected for the duty. The returns can be checked and corrected, and, as the original returns will be kept, any further combination of particulars may be easily prepared. As the registration system is not extended to Scotland, the old machinery is to be used there.

Southampton, August 22.—The greatest interest has been excited in this town by the arrival in the harbor this day of the *Orientat*, the first of the line of steamers intended to run between Southampton and Alexandria, under the new contract with the Government. This splendid vessel is one of the finest models of naval architecture afloat, and her excellence as a sea-boat has been amply displayed on her passage up from Liverpool. It is said that she will prove a *clipper*, her average speed up Channel having been twelve miles per hour, with all her stores and the greatest part of the coals for the voyage to Alexandria on board. The *Oriental* is so constructed as to be at once convertible into a war-steamer, carrying four sixty-eight pounders on swivels, and a formidable battery of broadside guns. She will leave this port with her passengers on the 1st of next month. It is said that an entertainment will be given on board on Wednesday next by the Directors of the Peninsular and Oriental Steam Navigation Company, to a party of distinction from London, including the Lords of the Admiralty, and also the representatives of the borough, and the members of the corporation.—*From a Correspondent of the 'Sun.'* [We have noticed this Company, and the *Oriental* steamship, elsewhere.]

Blackfriars Bridge.—The New Paving.—We are requested to call the attention of the public, and especially of the different paving committees, to the paving of the carriage way now in progress on Blackfriars-bridge. It is the first time the narrow paving has been tried in this metropolis, and it is considered a very great improvement, as a horse will not be so liable to slip as on wider stones. The blocks are principally of Guernsey granite, 9 inches long, only three inches wide, and square at the top and bottom. The substratum is formed of a concrete 12 inches thick, of stone-lime and Thames ballast. The contractor is Mr. John Mowlem, of Paddington, who has, we hear, met with very great difficulty in obtaining the granite from Guernsey. It is considered the best piece of paving in London, and it is supposed that the bridge will be open in about a week.

Steam Boat Nuisance.—To the Editor of the 'Times.'—Sir,—In your paper of to-day, I perceive a letter signed "Steamer," complaining very justly of the nuisance occasioned by the accumulation of steam-boats at the series of adjoining piers immediately above London-bridge. I beg to refer your readers to an equal nuisance below bridge, occasioned by two rival Gravesend packets, (the Sons of the Thames and a Star or Diamond boat) starting twice a day for Gravesend at the same moment, from contiguous wharfs, and racing at the most dangerous speed, to the great terror and danger of all persons compelled to go by either of them, especially if embarking or landing between the two ports. May I beg to inquire, why the officers employed in the conservancy of the river are not instructed to lay informations against these two boats, for exceeding the lawful speed of five miles an hour in the Pool? I would also inquire why the two companies have violated the pledge given to the Lord Mayor to start at different hours, which pledge was given when complaint was made to the Lord Mayor of a most alarming and nearly fatal accident which occurred to the Rev. William Palin in landing from one of these racing boats off Gray's, and which arose solely from the recklessness with which they were navigated? Hoping for your able co-operation in repressing this long-established and dangerous nuisance,

I am, Sir, your obedient servant,
August 26. BELOW BRIDGE.

British Naval Resources at the present moment.—The *United Service Gazette*, after denying the correctness of the account of the naval resources of England given in the *Globe*, pledges itself for the correctness of the following statement:—

We have 76 sail of the line available for service afloat, of which 22 are in commission. Of the remaining 54, one-third at least require extensive repairs before they can be equipped for service, leaving about 36 for future supply—a force, supposing it to be fully equipped, little stronger than that of the Russian fleet in the Baltic.

Of the 22 sail of the line building, and ordered to be built, there are not above six so far advanced to completion as to be available within six months after a war might break out; because the artificers of the dock yards would be first employed upon the ships afloat, which would fully occupy their time and exertions for three months at least.

The account would, therefore, stand thus:—

GUNS.	AFLOAT.	BUILDING.	
120	10	3	
110	1	3	
104	5	0	
92	1	2	
90	0	5	just ordered.
84	11	0	
80	1	7	2 or 3 half built, others not so much.
78	9	0	
72	38	0	
70	0	2	not half built.
Total	76	22	

A Model of Hobart Town.—On Monday, there was a private view, at the Gallery of the Society of British Artists, Suffolk-street, of Mr. G. Peck's magnificent model of Hobart-town, the capital of Van Dieman's Land. The model is constructed upon a scale of an inch to 20 feet, and includes every building, large or small, in that romantic and interesting town. The numerous churches, public buildings, streets, &c., are all represented in their relative proportion, and in their peculiar features of stone, brick, woods, &c. The principal object which strikes the eye of the spectator, is the regularity of the streets, which cross each other at right angles, and reach from one extremity of the town to the other; Macquarie-street especially, which is one mile and a half in length, and 60 feet broad, and is the principal thoroughfare in the town. The edifices are all built in a plain simple style, which is the case even with the Governor's house and Custom-house. The churches are the only public buidings which have any pretension to arcbitectural style. There were also exhibited two interesting moving panoramas, the one of Sydney, the capital of New South Wales; the other of the environs of Hobart-town.

A Report upon the Strength and other Properties of Anthracite Pig Iron. By Richard Evans, Manchester.—This pamphlet has been written at the request of the Ystalyfera Iron Company, and is the result of nearly 280 experiments upon rectangular transverse bars. The author modestly calls them,—"A Series of *Elementary* Experiments upon a metal now occupying the serious attention of scientific and practical men." The subject is one of considerable interest; and the manner in which it is here treated, accompanied by a number of carefully-compiled tables and data for reference, will cause it to be very generally read by all who would be acquainted with the strength and properties of Anthracite Pig Iron. The experiments we should add, were conducted at the establishment of Messrs. Whitworth and Co., Manchester.

Increase of New and Useful Inventions.—We have received a number of useful novelties from Mr. JONES, inventor of the *Prometheans* and some hundred other articles of general utility. We have now only space sufficient to call attention to them, as enumerated in our advertising columns, and to give them our passing good word. Their variety is surprising, for they include almost every thing that is requisite in a domestic establishment.

Atmospheric Railway.—This system of railway is put in action every Monday and Thursday, (as will be seen by our advertising columns) and judging from the number of visitors on these occasions, its merits seem to be appreciated as they deserve. Upwards of 1,000 persons were present on each of the last two exhibitions, and the trains on several occasions carried up 100 passengers.

Inventive "Notions."—"Notion" is an American word, and answers to our English word "idea." We confess, however, that the ideas of *our* countrymen fall infinitely short of the "notions" of the Americans. They beat us out and out; and positively put us to the blush, when going into 'an explanation.' Besides, an American does nothing by halves. Ashamed of having only a "single notion," he goes triumphantly a-head, and astonishes us with a "double notion." * We alluded to this Double Notion in our last, and described it as being sufficiently extensive to cover a table calculated to accommodate twelve persons at dinner. We regretted that our space would not then admit of the explanation given of the meaning of the said "Double Notion." We now make room for it, and are sure our readers will thank us for so doing; it is as original as it is racy, and quite characteristic of Yankee land. Of the paper itself, we cannot say more than we have already said; its dimensions are such, that it would almost require the aid of a ladder to reach its summit; and its contents so varied, that the "long vacation" would hardly suffice properly to digest them:—

"THE DOUBLE NOTION.

Full *notional* was he, and still would think
On *notions* strange, admixtures wild and mirthful,
Fancy and thought and reason all combined.
The Will o' the Wisp.

"What is a notion? Learned men,—philosophers, metaphysicians have been sorely puzzled to define what a notion is. *Locke* calls a notion a compound of simple ideas into complex ones. *Norris* contrasts notions with realities, as if they were the product of imagination. *Bolingbroke* has it after Locke, that compositions of simple and complex ideas may more properly be called notions. *Holland*, as if he were a true Dutchman, uses notions as synonymous with thoughts and ideas. Shakspeare makes it the same as mind. *Glanville* uses the word to signify foolish, vain, nonsensical ideas. Great authorities might be multiplied without end; but it is sufficient to cite the universal acceptation of the universal Yankee nation, that a 'load of notions,' in a pedlar's cart, comprises a little of every thing and *more too*; which definition is descriptive of our Double Notion.

"We have here complexed compounds, sufficient in variety and quantity for one—simple ideas intermingled for another—genuine thoughts in abundance for a third—and fancy, folly, and vanity enough mixed up with them to content the most greedy notionist on earth. Who likes not one column, may turn to another. Who is notional in his reading, may hunt from page to page till he is suited. Who is cross-grained, may begin at the bottom and read backwards. Who will not rest satisfied at all, may throw away the whole sheet—*after he has bought and paid for it.* As we would not force our best dinner into the stomach of him who is equally devoid of taste and appetite, so our notions shall not be compelled to enter the mind of him who has no mind to enjoy them. Such is the simple notion we entertain of our compound Notion; and he who runs may read, if he will, or be who lies lazily on his back may enjoy his own dear dreams, and our Notions shall not disturb him. The sage may delight himself in poring over its pages; or the kind parent may spread two of them on his floor, one of them one side up and the other reversed, and set his little ones, by the dozen, *if he has been lucky (?) in progenitizing*, to crawl over his new fashioned carpet, and study workmanship for their young ideas. The labor teaching, in such a case, would he performed, as it were by machinery; and reared on so rich a soil, thought would spring up, as Clifford says of love, "consummate in the birth."

"We have plundered England's literature of its newest and richest gems. The offering we make is not a handful, nor a basketful, nor a cart-load, but a ship's freight, ample and costly. It is gorgeous like the throne described by Milton, which "outshone the wealth of Ormus and India," and comes with all its new-born freshness and vigor from the precious mines of thought and imagination—stalking with the study and majestic tread of giants; or fishing † like wanton fairies in the moonbeams. Now it indulges in delicious dreams, such as may visit some fond, betrothed maiden, sleeping on a bed of roses, and visited by angels whispering of love. Then it starts away with the wildest imaginary terror of the Hartz Demon, in his own black forest, with the darkening darkness illumined only by flashes from the eyes of demoniac monsters, and no breath but the suffocating fumes of sulphur from regions infernal. But this is not alarming even to the delicate nerves of sweet sensibility, for in an instant again it is all laughter and fun, as antic as Pan and as jolly as Bacchus. The sylvan shades

* The "*Boston Notion*;" an American newspaper, of most gigantic proportions,—the largest sheet of printed matter since the days of Faust.

† Does not our facetious Notionist mean 'flitting?' We never before heard of 'wanton fairies' *fishing* "in moonbeams!"

ring with merriment as the dancing nymphs press out the juice of the luscious grape, or whip the roguish little cupids with bouquets of roses, the thorns of which, tingling sweetly, cause the uproarious urchins to cut squeer antics around the old red-faced wine bibber, whose sides shake with convulsive laughter at their grotesque contortions, and most unheavenly screams, intermingled with the youthful promises of "I wont again."

"But there is another class provided for—*chacun à son gout*—and it is for us to provide for each one's peculiar palate. There is a sort of beings—they must, we suppose, be called human, whose hearts lie low in their abdominals. Every thing within them tends downwards, like the corners of their mouths—a laugh is more hideous than a funeral knell at a wedding—having determined to be wretched they cry with poor King Edward, "Accursed be he who bids me be of comfort more." These vinegar-visaged, and sour-kront-hearted uncomfortables love to sit out a whole life-time, licking down sulphur and tartaric acid, their whole consolation consisting in cursing the molasses, which is necessary to liquify and render the powders swallowable. With all our hearts they may indulge their humor—no, not their humor, for they have none—but their acid acerbity. They too shall be fed after their own taste. They may turn to the awful conflagrations, horrible murders, burglaries, robberies, rapes, together with

"Death and destruction in the field of battle;"

and, though they may not be pleased, yet they may increase their spleen by feeding on that which is evidence of total depravity—at least in a practical sense. They may rejoice that some villains are as bad as they feel, and bless our Notion for giving them that only consolation of which their hearts are capable—when they have finished their feast of horrors and crime, they may look as black as they please at us, because there is nothing, as they may say, in the Notion worth reading. We have many time looked a devil in the face, blacker than they, and he always said, "don't never be afraid."

We have copied sufficient to give our readers a specimen of the Editor's *humor*. Now for a glance at his *tact*, as exhibited in an advertisement of his "Double Notion," that appears in a corner of the paper:—

"THE BOSTON NOTION IS MUCH THE LARGEST AND CHEAPEST PAPER NOW PUBLISHED IN AMERICA!

☞ But little more than half a year has elapsed since the first number of this mammoth sheet—the "Colossus" among newspapers—was first issued, and it now enjoys a circulation and popularity

UNPARALLELED IN NEWSPAPER HISTORY.

From week to week it presents to its readers the best writings of the most eminent literary individuals of this and other countries—among the most prominent may be enumerated, Dickens (Boz)—Bulwer—Irving—Marryatt—Cooper—James—Knowles—Ainsworth—Jerrold—Howard—Hood—Lover—Fielding—Moore—Bryant, &c., &c.

Also, from the best leading articles and popular periodicals of both continents—such as the New Monthly—Metropolitan—Blackwood—Bentley's Miscellany—Frazer's Magazine—Tait's Magazine—Knickerbocker—Ladies' Companion—Ladies' Book—Gentleman's Magazine, &c., &c.

The whole world of literature is ransacked to fill it. From the study of the philosopher, down to the Police Court, through all the regions of reason, poetry, romance, wit, and the ample record of folly, it gleans from the past and the present and from all nations, as pleasing and useful a combination of recondite thought and current history, as the world can supply or industry produce. This is our "BOSTON NOTION."

We will only add, that the "*Boston Notion*" is a very excellent notion; and that we hope to receive many more notions from the same quarter.

REPORTS OF SCIENTIFIC MEETINGS.

BOTANICAL SOCIETY OF LONDON

Aug. 7. John Reynolds, Esq., Treasurer, in the Chair.

(*Conclusion of the Monograph on Ferns.*)

In our last we promised to continue the valuable observations of Mr. Riley in connection with the growth of ferns from seed. We must distinguish between the spontaneous growth of ferns from the seed they shed, and raising specific plants from sporules purposely sown, because in every collection of ferns some species, as *Aspidium Molle, Gymnogramma Cheirophylla, &c.*, grow without any care; and, indeed, so freely as to prove an inconvenience. As many ferns neither throw out offsets, nor bear division of the root, their only method of propagation is by seed; and as importing new species is very expensive and difficult, it is also a valuable method of increasing the number of living examples. It is necessary, in the first place, to examine the *Sori*, and see whether the capsules are burst or not, and if any seed remains; want of attention to this has frequently occasioned disappointment, for in some ferns, as *Todia Africana*, the seed is quite dispersed in half an hour after the capsules become ripe. The fertile seed is not perfectly transparent, and in a ripe and healthy state the sporules appear slightly invested with a glutinous secretion, which causes them to adhere to anything they touch, whilst in dry or decayed seed that quality is lost. With Ross's compound microscope (the lenses about 120 linear magnifying power) these variations of the sporule may be readily observed.

To secure the vegetation of such minute bodies, there must be a uniform state of both heat and moisture; the pots therefore in which the sporules are sown should be filled about one third with potsherds as drainage, and covered to within an inch of the top with a light soil, composed of a mixture of *three* parts peat, *two* parts sand, and *one* part loam; if the soil retain moisture, the surface is quickly covered with *confervæ*, which destroy the seedlings.

After scattering the seed very slightly on the surface of the soil, the pot should be immediately and closely covered with a glass, which promotes a more even state of temperature and moisture than if it were exposed to the atmosphere of the stove. If the soil be thoroughly moistened at the time of sowing, and kept closely covered, it will not require water very frequently; but when that is necessary, it must be very carefully and evenly supplied, and in just sufficient quantity to keep the soil moist, without suffering it to become saturated.

On the appearance of germination, a little air may be given, and increased as the plants progress. The time of the first appearance of the seedlings differs with various ferns, from ten days to three or four weeks; and the period until the plant assumes its perfect form, differs still more.

As most of the British and some foreign ferns can be cultivated in the open air, it may not be inappropriate to remark that the situation for such a purpose should be well shaded, the sun's rays being more destructive to ferns than cold winds or wet. A light heath soil with broken stones about the roots, will serve for most species; some, as *Aspidium Cristatum, Asp. Thelypteris*, and *Osmunda Regalis*, require considerable moisture. Stagnant water is prejudicial to most ferns, and manure mixed with the soil is also injurious; *shade* and *moderate moisture* seem the chief requisites. The beautiful *Adiantum Pedatum*, a native of France, the *Aspidium Bulbiferum, Struthiopteris Germanica, Dicksonia Pilosiuscula, Aspidium Achrosticoides*, and many other exotic (especially North American) plants, will grow with the British species in equal luxuriance; indeed, better and more freely than some of our indigenous ferns.

Those who trace in ferns no other beauty than what the elegance of their form exhibits, are always pleased with a collection of well-dried ferns; and they who study them derive double advantage from examining specimens which have been carefully prepared, and in which the fructification exhibits its distinctive characters. Fronds grown in spring form the best specimens, for their autumnal fronds will often differ materially from the earlier ones. They should, if possible, be taken before the covers are cast off or obliterated by the ripening capsules; in many species the *Sori* continue to ripen, and enlarge during the process of drying, and as the *covers* form an essential point in their investigation, it is better to collect some specimens in an early state before the *indusium* has opened. Where the plant has both barren and fertile fronds (as *Blechnum Borealc*) specimens of each are necessary, and in all cases they should be cut from the very base of the *stipes*, as the space which occurs between that and the *pinnæ* differs in various ferns. The fronds of some, as *Asp. Thelypteris*, alter when in fructification, the leaflets becoming narrower and more acute, whilst their margin rolls over and partly conceals the capsules.

The plan adopted by Mr. Riley in drying ferns is the following:—The specimens are laid within a sheet of thick blotting paper, the leaves and leaflets carefully disposed according to their manner of growth (a few penny pieces are good auxiliaries in holding down the various parts until the whole is arranged); between every sheet of blotting paper a sheet of common paper is placed, and a piece of millboard between every three or four, to prevent the stems of some marking the leaves of others. A board should be put on the top and bottom, and the packet placed either in a screw-press or under a considerable weight. In about two days the specimens should be examined, when if any of the leaflets are displaced they can be rectified; the papers will then require drying; the best method is to have them *ironed*, as it removes the damp, and renders the surface smooth; but on no account iron the specimens. If the ferns be very full of moisture, or the collection very numerous, it may be necessary to repeat the ironing of the papers after another interval, and in about a week or ten days, according to the warmth of the situation where they are placed, they will generally be dry; but some of the thick-leaved exotic ferns require a longer time, and the pressure should not be relaxed until the specimens become quite stiff.

URANIAN SOCIETY.

Aug. 4. Lieutenant Morrison in the Chair.

A paper on "the Obliquity of the Ecliptic and the Transition of the Poles," by W. D. Saull, Esq., Vice President, was read, of which the following is a digest:—

The facts afforded by geological research prove that the polar regions of the earth were once influenced by the rays of a vertical sun; for fossil remains of animal and vegetable existences, which when in animated organisation could have subsisted only within the tropics, have been found imbedded at a latitude as high as 70 deg. north.

In investigating the causes which have produced these apparently natural contradictions, the oblique angle formed by the Ecliptic has presented a solution of the matter.

As in the days of Copernicus, and afterwards those of Galileo, the doctrine of the earth's rotation easily explained those appearances which, under the assumption of solar revolution, were mechanical absurdities, so in these times, when the Laplacean theory of polar oscillation rendered geological facts complete fallacies, the simple admission of a transition or revolution of the poles latitudinally, would at once harmonise geology with astronomy.

It is a well known fact, that the obliquity of the ecliptic is a diminishing quantity, and if, as he considered, it was subject to a constant variation, the time would come when the ecliptic and equator would coincide. He would now ask (granting that this takes place), what caused these lines ever to vary from the parallel? surely no freak of nature! Everything that is at variance with universal laws is foreign to the mistress of the universe. Well, then, he had a right to argue, that as the obliquity was a diminishing quantity, it had been previously an increasing quantity; and that as planets perform successive revolutions round their primary, so a *plus* variation would succeed a *minus* obliquity, and thus a polar revolution or transition would be accomplished, not once only, but always.

If such be the case, the beings that now inhabit the equatorial and tropical regions would become extinct under the freezing climate of the frigid zones, and thus the geological phenomena now so evident of such a change would be again repeated.

It might be objected to by some, that if the axis of the earth became parallel with the ecliptic, neither heat nor light could be obtained at the new equatorial parts, while the then polar regions would be exposed continually to a vertical sun; the case, however, was *vice versâ*, for he found by experiment that the place of greatest tangential motion generated most heat; this might be easily conceived;

and as to light, the new equator would revolve over the sun, but vertically so, compared with the position of the present equator, did it and the ecliptic coincide.

He considered that the poles in transting, perform a spiral motion, the eccentricity of which increasc towards the solar ecliptic from both poles.

After the reading of this paper, the following discussion took place.

Mr. J. M. Cavalier thought that the theory of the transition of the poles was discordant to the mechanical arrangement of the system; for his own part, considering, as he did, that the line of axial motion could not upon mechanical principles incline more than 45 deg. from the vertical of the ecliptic without that motion ceasing, he felt at a loss to comprehend the bold theory put forth by Mr. Saull: he would admit the geological facts adduced by Mr. Saull, as also his inference that the animal and vegetable remains found in the arctic regions must have been the productions of tropical climes, but he thought that these might be accounted for by ascribing their cause to a mere shifting of the *polar regions* reciprocated by an accordant movement of the *equatorial parts*; he had no proofs to bring forward to substantiate such an assumption, yet he would rather admit such in preference to a transition of the axis of rotation, for the latter appeared to him a mechanical impossibility.

As regarded the oscillatory theory of Laplace, he must confess that it was not sufficiently conclusive to be entertained as certain.

The most simple method of accounting for solar motion imparted, was entirely set aside by the theory of transition; he was as certain as any one *might* be, that Mr. Saull would never be able to reconcile his hypothesis with any of the present received theories of planetary motion; he did not insinuate that Mr. Saull's theory was fallacious because of this assumed disagreement, but merely by way of stating that if the theory of transition were correct, a new system must result from its establishment.

Mr. Cavalier considered that the most satisfactory way of explaining the cause of the planetary motions was by the following *assumption*, viz., that the sun revolving on its axis disturbs the medium existing throughout the system, throwing, as it were, this "*ethereal fluid*" over the planets in the line of the direction of its motion, thus striking the spherical surface of the planets tangentially; this would of necessity cause the planets to rotate, and he supposed that their rotary forces were the primary, although not the sole causes of their orbicular revolutions; it would be easily seen that the projected medium which acted below the point of tangential contact, was sufficient to keep the planets at the proper distances from the sun, while their rotary motions kept them from flying off in straight lines.

Now, viewing Mr. Saull's theory in connection with the above *assumption*, it was conclusive that no transition of the poles could take place, for immediately the ecliptic and equator formed an angle of 45 deg., rotary motion must cease.

Lieutenant Morrison observed, that there were three modes of examioing the question (which in itself and its important consequences was not equalled by any matter that science had ever investigated); these were geological, astronomical, and philosophical. As to the first, the evidence afforded was so decided, of vast antiquity, and various degrees of heat upon the surface of the earth, that it would be conclusive of Mr. Saull's views, if the other evidence were not opposed. The philosophical evidence, being chiefly that of the causes of heat and rotation, was very uncertain; for, unhappily, in almost all the great questions of cause and effect, modern philosophers were divided into as many sects as were those of ancient Greece. The only conclusive evidence was that of astronomy, so far as founded on mathematical demonstration. And if this could be brought to show the impossibility of the transition of the poles, of course geologists must seek another explanation of their discoveries. As far as he could learn, there had not been any *demonstration* of the impossibility of this transition. The invariability of the earth's motion in the plane of its orbit, was quite another thing; that might truly be demonstrated, but then the earth might move in the same plane, and yet the body of the earth turn in time all its various points to the sun. The supposed secular variation of the obliquity of the ecliptic did not seem to be well established. And he was inclined to think the Hindoo astronomers, who considered that in each revolution of the equinoxial points the pole moved four degrees in a spiral curve towards the equator, had some foundation for their opinions. It was taught in some of the *Puranas*, that at Delhi, the sun when in Leo and vertical there, was used to set beyond the *Asta-giri*, which signified the great fiery mountain. Now, if we elevate the pole to the latitude of 36 deg. and place Delhi in the meridian, we find the western horizon does actually cut beyond the place of the great fiery mountain in Teneriffe.

Facts like these in which Hindoo mythology abound (and of which some others were mentioned), make us question the supposed justice of declaring the writings of the Indians "mere poetical dreams."

On the whole, he was prepared to go with Mr. Saull, and to believe, that about 193,000 years ago the sun was vertical to London; as he believed the present variation in the obliquity would if permanent (and it had not been proved to be otherwise) lead to that necessary conclusion.

The members appeared to be unanimous in favor of Mr. Saull's views. The meeting then adjourned to the 1st September.

PUBLIC COMPANIES.

THE PENINSULAR AND ORIENTAL STEAM NAVIGATION COMPANY.

The directors of this company, with a spirit worthy of the enterprise in which they have embarked, introduced on Wednesday morning a numerous party of friends and visitors to their splendid steam-ship, the Oriental. At 9 o'clock in the morning, a special train was in readiness to transmit the party to Southampton, whence they were conveyed by a smaller steamer to the ship. The journey to Southampton, which formerly occupied from 9 to 12 hours, was accomplished in rather less than two hours and a half. The public have become so accustomed to the wonders of railway travelling, that what ten years since was considered impossible, is now thought scarcely worthy of notice. Still, however, 76 miles in two hours and a half, as our Transatlantic neighbors would say, is "going ahead" pretty fairly.

The Oriental is believed to be one of the finest specimens of naval architecture. She is frigate-built; her engines are equal to 450 horse power, and appear to be of the best construction. The elegance with which she is fitted up, and the accommodation which she offers in every department, must render her acceptable to the most fastidious passengers. She is stated to be of 1,673 tons burden.

It had been, we believe, originally intended to make the circuit of the Isle of Wight, but this arrangement would, it appears, have been inconvenient for more reasons than one, so it was determined that the vessel should run out only as far as the Needles. This trip, short as it was, afforded some opportunity, not indeed of testing the qualities of the Oriental as a sea-boat, but of appreciating the excellence of her machinery, and of examining the elaborate arrangements which have been made for the comfort and convenience of the passengers.

From the Needles she returned past Cowes to Spithead, and reached her moorings off Southampton pier a little before 7 o'clock. At half-past 7 o'clock, the guests left Southampton by a special train on their return to town. The journey was performed in even less time than before, the train arriving at Vauxhall in a little more than two hours and a quarter. The Oriental sails for her first voyage on the 1st of September, and will probably reach Alexandria in from 12 to 14 days. Her fine sailing qualities have already been displayed in the passage from Liverpool to her present station; and with the powerful machinery by which she is impelled, she will be of great service in insuring the rapid transmission of passengers and intelligence from India. It was remarked, during her short run on Wednesday, that notwithstanding the immense power of her engines, scarcely any vibration was perceptible.

ADVERTISEMENTS.

THE FACILE DIVESTER CORSET. J. P. WESTHEAD, Patentee.—This elegant Invention is a decided improvement in the apparel of Ladies; it is highly conducive to comfort, and is remarkable for simplicity and durability. Speaking of the *Facile Divester Corset*, the "INVENTORS' ADVOCATE" remarks:—

"The inventor of this most useful improvement on the inconvenient and badly-constructed stays worn by our fair countrywomen, deserves our best word. He has conferred a boon on society, which will not soon be forgotten.

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"All persons who examine this patent, must admit Mr. Holmes to have fully established the principles insisted on in his report to the East India Committee, in 1838, of the practicability of building iron ships without limits to size, and on the indispensable necessity of the adoption, not only of much larger ships than had been contemplated, but that it was equally indispensable, in point of profit, that they should be built of iron, and by the adoption of his improvements a great reduction in the first cost of wear and tear would be effected. Many parts of these improvements are, however, equally applicable to wood ships, as regards safety to the passengers; and wherever they are adopted, we cannot conceive any case or circumstance in which a ship can be placed in danger. In the fullest sense of the word, they become life-boats, without waste of room, or extra cost."—*From the "Inventors' Advocate," July 1.*

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THE

INVENTORS' ADVOCATE,

AND JOURNAL OF INDUSTRY;

A WEEKLY BRITISH AND FOREIGN MISCELLANY OF

INVENTIONS, TRADE, MANUFACTURES, LITERATURE, AND THE ARTS.

PRINTED BY JOHN EAMES, 7, TAVISTOCK STREET, COVENT GARDEN.

No. 58.] SATURDAY, SEPTEMBER 5, 1840. [PRICE FIVEPENCE STAMPED. CIRCULATING FREE BY POST.

STEAM FIRE-SHIPS.

We are glad to find that our neighbors give our government credit for assiduously availing themselves of modern improvements and discoveries in the mode of warfare; for whether this opinion be deserved or not, the existence of it may produce the same effect as if we were in a formidable state of preparation. We must, it seems, go abroad to find out the wonderful things which we have been doing at home; therefore, we take from a Brussels paper, the *Fanal*, the following account of some terrible steam fire ships which it appears are in readiness in our ports to launch destruction against any enemy that may appear against Great Britain. The account is stated to have been supplied by an engineer, who is well acquainted with the preparations which we have in reserve for the first maritime warfare. We give it without in the least degree vouching for tho correctness of the foreign engineer's statements:—

"Among the formidable war engines which are preparing at Woolwich, I know of none more terrible than the steam fire-ship, which, like the *Infernal*, throws a jet of fire as far as the most powerful fire-engines throw a jet of water. These fire-ships have also two conical-shaped tubes; bound round with hoops like a cask: these cones are attached to the two sides of a plank of fir from 80 to 90 feet long; on this kind of raft is placed one of those old steam-engines of from six to fifteen horse power *which can be purchased in any quantity for the price of old iron!* and on the fore part is placed a single Paixhan cannon, loaded to the muzzle. This machine is intended to be launched in the night with all the rapidity it is capable of, against the sides of the enemy's ships. The iron point of the plank will strike into the ship, and the concussion will fire the cannon, which will make an enormous hole below the water mark, which will immediately sink the ship. The peculiarity of these fire-ships is, that if they fail to strike the ship against which they are directed, they continue their course in a straight line, and a steam ship may be sent to bring them back, to be launched forth again after having a fresh supply of fuel.

"A hundred of these machines will be sufficient to destroy a hundred men of war of the ordinary construction, which would be unable to escape from their destructive powers. They do not cost more than from 8,000 to 10,000 frs. They are called sea-javelins. You may depend upon it, that maritime warfare will henceforth be completely changed; that steam will be the great agent now, and that battles will be fought by steam-engines. The people who possess the greatest number, and who are the most ingenious, will possess pre-eminence at sea and on land during war, as they now do in time of peace. Is it not a shame that our government do not become aware of the necessity of encouraging mechanical studies until they are forced to admit it by the conflagration of their shipping and the destruction of their armies; and that they do not acknowledge, as they ought to do, that an ingenious mechanical philosopher is of more use to his country than all the orators in the world?"

In another number of the same paper, we find also the following notice of the *Infernal:* "There is now fitting out with the greatest secresy, in the arsenal of Woolwich, a steam-ship which will be alone enabled to set fire to a whole fleet. This ship is rendered completely ball-proof by thick bulwarks of wood. It has no paddle-wheels, but is moved by an Archimedes screw under the water. It is furnished with four high-pressure boilers filled with a wildfire composition, consisting of naphtha, tar, grease, &c., intended to be thrown by powerful force pumps through red hot tubes. This mixture, thus heated as it is poured out, will inflame in the air, and fall like a rain of unextinguishable fire on the sails, the rigging, and men of the enemy's ships. When becalmed, an entire fleet might be destroyed in less than half an hour by the *Infernal*. All maritime warfare will, henceforth, be conducted by steam-ships, and by means of the terrible engines which science has invented during the last twenty-five years. The ordinary line of battle ships will only be of use as floating magazines to convey coals and combustibles; they will be the store ships of the steam-boats, and nothing more."

THE COTTON CULTURE AND MANUFACTURES OF THE UNITED STATES.

A series of papers, exhibiting remarkable ability in a commercial, statistical, manufacturing, and agricultural point of view, have been published in the *Boston Patriot*. They have created quite a sensation amongst the planters, politicians, and merchants of the United States, in consequence of the force and propriety of their reasoning. We regret that their number and extreme length prevent u giving a view in detail of their entire contents. The series would fill a small volume.—We proceed, however, to notice a few facts and reasonings that will not fail to be examined with interest by tho British importers and manufacturers of cotton from the United States.

The writer in the *Patriot* very properly commences with the maxim, that the "market price of an article is regulated by its demand." He then argues, that the advance in cotton, which commenced in 1833, was occasioned by a falling off in the supply, as compared with its increased consumption. The low prices preceding that period, he considers lessened the imports from India, and kept the crops of the United States below what they would have been under the stimulus of high prices. The great advancement of prices from 1834 to 1837 induced a rapid extension of the cultivation of cotton in the United States, which, in the course of a few years, nearly doubled its product, and prices have fallen from 30 to 40 per cent. below the average rates of 1834 to 1837. He argues, too, that there was over-production of cotton fabrics in England in 1838, as may be inferred from the sudden and extraordinary increase of the raw material. Thus the cotton imported into England was—

In 1837	357,000,000 lbs.
In 1838	459,000,000 lbs.
In 1839	only 345,000,000 lbs.

The present year will show an increase; but then it is well known that, in many instances, the manufactured articles may be bought below the cost of manufacturing.

He then enters into another branch of his subject, and seems to think that the United States cotton manufactures have advanced too rapidly. The statistics prove that the cotton manufactured in the United States was—

In 1833-4	196,400 bales.
In 1835-6	236,700 „
In 1837-8	246,000 „
In 1839	276,000 „

The above statement shows that the increase of consumption in the United States, for cotton home manufactures, reached 50 per cent. in five years; while the importation of cotton and linen fabrics from Europe was nearly doubled in the same period. But he argues, that owing to the pressure of the times, "many of these could not be paid for."

An important feature in the reasons adduced for

the over-production of cotton at the period in question, was the "inflated state of the currency." Thus, according to the public returns, the issue of Bank notes

In 1834 was	.....	95,000,000 doll.
In 1836	.....	186,000,000 „
Bank liabilities (deposits and circulation in 1834)		191,000,000 „
Ditto, in 1836,	.....	341,000,000 „

Hence, also, the primary and efficient cause of the great revulsion of 1837.

The effect of the expanding and redundant currency, too, was to induce an erroneous investment of capital in cotton manufactures, which "evil was cured by the suspension of work in some of the mills, an increased exportation, and the increased consumption and increasing population in the United States." In 1838 9, the currency being again in excess, cotton again advanced, and too extensive speculations were once more induced.

The able writer, therefore, contends that the people of the United States engaged in the cotton business are suffering from the effects of over-production, a difficulty which, as far as this country is concerned, will only be overcome as it was before, by a decreased production and an increased demand.

He then shows the effect of a general peace on consumption. Thus, the consumption of cotton in Great Britain was, in—

1800.....	56,000,000 lbs.
1818.....	112,000,000 lbs.
1821.....	126,000,000 lbs.
1837.....	357,000,000 lbs.
1838.....	459,000,000 lbs.
1839 (fell off).....	345,000,000 lbs.

We will not follow further the facts and reasonings of this author, but we may draw attention to one important conclusion that may be drawn from his writings, viz.—that the present production of cotton in the nations of the civilised world is more than the consumption of the world demands! It therefore follows, that until the relative proportions of demand and supply be more nicely balanced, no material or permanent advance in the price of the article can be anticipated.—*Journal of Commerce.*

AGRICULTURAL STATISTICS OF FRANCE.

The government and the political economists have, during the last century and a half, had recourse to all possible methods for the purpose of estimating the value of the raw produce of France; but they have not been enabled to obtain a knowledge of this important fact excepting by an inventory of the productions of the country. The half of this difficult task having been accomplished, we can already derive precise and complete ideas on the extent and value of one half of the agricultural districts of the kingdom.

The eastern portion of France is divided into two regions. It is found, on calculating the extent of the land comprised in each, that the northern division contains rather less than thirteen millions of hectares of land, and the southern division rather more.

On this extent of surface, of twenty-six millions of hectares together, the cultivated lands of all kinds, including nursery grounds, orchards, and other plantations, occupy nine millions of hectares, or rather more than a third; pasture land two-fifths; and forests more than a fifth. One twenty-sixth part of the whole surface, or more than a million of hectares, is occupied as the sites of towns, villages, churches, canals, and roads.

Though the land devoted to agricultural purposes is nearly the same in the two divisions, the distribution of the various kinds of culture is very different. In the north, the cultivation of corn is more extensive by 1,200,000 hectares; the orchards, nursery grounds, and other plantations, exceed those of the south by more than a half, and the woods and forests also; but, on the other hand, the pastures, the heaths, and the fallow lands occupy only 1,000,000 hectares instead of six, as in the southern departments.

The gross revenue from the agricultural produce amounts in the northern division, to 1,300,000,000 frs., and in the south to 945,000,000. The difference between the two is 355,000,000 frs., or more than a sixth of total value, which amounts to 2,241,000,000 frs.

To this amount, which is derived from the forty-three departments together, must be added different other products of agricultural industry, which carry the total amount to upwards of 2,500,000,000 frs.

THE NUMBER AND VALUE OF DOMESTIC ANIMALS.

The principal kinds of domestic animals pertaining especially to agriculture, amount in the eastern division of France to upwards of 25,000,000. Of this number, horned Cattle form less than one fifth; sheep three-fifths, pigs one tenth, horses a twentieth. The northern departments contain a much larger proportion of cattle and pigs than the south, and from three to four times as many horses; they possess fewer sheep, goats, mules, and asses. The value of these animals is estimated at 877,000,000 frs; that is, 371,000,000 for the cattle, 157,000,000 for sheep, 87,000,000 for pigs, 200,000,000 for horses, and 47,000,000 for mules, &c.

The number of animals annually killed for consumption, amount in a year to two oxen out of seven, one cow out of seven, and a greater number of calves are killed than are kept to grow up. Of 45,000,000 sheep and lambs, one-fifth part is killed annually. As to pigs, as many are killed in a year as are left to grow. On the whole there are 7,000,000 animals killed for the sustenance of the 16,000,000 individuals who compose the population of eastern France.

The quantity of meat consumed amounts to 327,000,000 kilogrammes, estimated in value at 260,000,000 frs.; the horned cattle supply two-fifths of the quantity, sheep one-eighth, and pigs nearly one half. The northern departments consume nearly twice as much beef and veal as those of the south, and a half more of pork; but their consumption of mutton is only one-third that of the southern departments. The domestic animals add to the agricultural riches of eastern France,—

1st. An annual revenue of	350,000,000 frs.
2d. A consumption of meat estimated at	260,000,000
Total	610,000,000

Thus we perceive that, in this half of the territory of France which lies to the east of the meridian of Paris, the national wealth receives annually from the produce of agriculture a gross revenue composed of

1st. Agricultural products valued at the least at	2,500,000,000 frs.
2d. Products from animals	610,000,000
Gross revenue from agriculture	3,110,000,000

It is probable that the other agricultural produce omitted in this estimate would raise the total amount to 3,500,000,000 frs.; but this addition is only conjectural.

EXPIRED PATENTS.

PATENTS THAT HAVE EXPIRED DURING THE WEEK ENDING AUGUST 29, 1840.

ENGLAND.

JAMES YANDALL, of Cross-street, St. John's, Waterloo, Surrey, for *a certain improvement or improvements on apparatus for cooling and heating fluids*, Aug. 24.

FRANCIS HALLIDAY, of Ham, Surrey, *improvements in raising or forcing fluids*, Aug. 25.

WILLIAM DOWNE, of Exeter, plumber and brass-founder, *improvements on water-closets*, Aug. 25.

ROBERT BUSK and WILLIAM KING WESTLEY, of Leeds, flax-spinners, *improvements in machinery for heckling or dressing, and for breaking or clearing hemp, flax, or other fibrous substances*, Aug. 29.

SPECIFICATIONS.

A LIST OF SPECIFICATIONS

ENTERED AT THE ENROLLMENT OFFICE, UP TO THE WEEK ENDING AUGUST 29, 1840.

(*Continued from page* 132.)

ENGLAND.

WILLIAM BRINDLEY, Northwood-street, Birmingham, Warwick, paper-maker, *improvements in apparatus employed in pressing cotton, wool, and goods of various descriptions*, Aug. 25.—According to the usual mode of pressing wool, cotton, &c., after it is sufficiently pressed, it is customary to lash or tie it together into bales, by passing cords or strings under and over the bale of wool or other matter; this causes very great labor, and is attended with great expense. Now, the object of this invention is the arrangement of an apparatus applied to the press, by which the strings or cords, after having been fixed to the press, and passed under and over the bale of wool, before the pressing of the wool commences, are drawn out and attached to a roller, which roller is set in motion by a rack and pinion, so that as the wool becomes pressed by the action of the press, the cord is at the same time being wound on to the roller, and all the workman will have to do, when the wool is sufficiently pressed, is to remove the strings from the roller, and tie them together.

The followers are grooved, in order to receive the cords, which hang over on each side, and are attached to rollers.

The second claim is the method of pressing two or more bales at the same time. A rack is applied to the bottom of a sliding frame, which holds the bales of wool; thus, while the bale is under the press, the other is arranged on that part of the sliding frame, which projects laterally or longitudinally, as may be most convenient; and when the cords are fastened or secured to the bale under the press, the workman, by means of a winch-handle, raises the follower, and, giving motion to the rack pinion, causes the sliding frame to carry out the pressed bale, and bring in the loose bale to undergoa similar pressure.

THOMAS FARMER, of Gunnersbury House, near Acton, Middlesex, *improvements in treating pyrites and other matters, to obtain sulphur, sulphurous acid, and other products*, Aug. 25.—This invention consists of treating pyrites or other substances containing sulphur in a state of combination, and by causing them to burn in a furnace without the aid of fuel, so as to disengage the sulphur which they contain, and form thereby sulphurous acid gas, or sulphur in its simple state. The furnace having been heated in the first instance with coals, or with burning pyrites, is afterwards fed with pyrites introduced in the doorway; and the further advantage of this invention, consists in the mode of charging the

furnace, regulating the admission of the atmospheric air, and the withdrawing of the decomposed materials.

The furnace has two chambers, one above the other, the doorway of the upper one is in front, and the lower chamber has its doorway behind. The pyrites with the fuel is first placed in the upper chamber, and is lighted in the ordinary way, and whatever particles escape through the upper grating, the lower furnace will consume, which residuum is removed when required, and as soon as any pyrites in the upper furnace form into clinkers, such clinkers are removed, and fresh pyrites are thrown on to the burning fuel, which yields its sulphurous acid gas to be passed off through a chimney or channel into a chamber, where it is treated as sulphur heretofore.

When it is designed to treat for sulphur, rather than for sulphurous acid gas, the door must be closed entirely, and only sufficient air must be admitted through a vent, in order to support combustion; and to facilitate the sublimation of the sulphur, a vapor of water must be passed from the ash-pit to the burning pyrites, which impart their sulphur to be condensed in the ordinary way adopted.

THOMAS HUCKVALE, of Over-Norton, in the county of Oxford, farmer, *improvements in ploughs*, Aug. 25.—First part relates to a mode of constructing ploughs with double shares, so formed that each portion of the share, at one time, acts as an ordinary share, and at other times as a coulter, such double share moving with a mould board on an axis, whereby, in using such ploughs, the earth of the furrow will be moulded or thrown in the same direction in proceeding up and down the field. The share is in the form of an angle iron, with a concave surface for the interior; and the axle moving in bearings, carried by the beam or body of the plough, passes through the mould-board, and into the heel of the share; thus, by the aid of a crank handle, attached to the reverse end of thia axle, the ploughman is enabled to turn either to the right or left the position of the share which has been working horizontally, to assume a vertical position, so as to act as a coulter and share alternately. The whipple tree in front is so constructed with pegs and holes, as to enable the ploughman to increase or decrease the width of the furrow.

Third claim is a shoe or foot worked by a screw, to give the plough its proper pitch or dip.

Fourth claim is for levelling lands, by means of a long and narrow share, placed behind the beam of a carriage, to which share are fixed handles for the ploughman to hold by, in order to raise or lower the blade, according to the surface of the land that it moves upon.

Fifth claim is for a paring plough, that has three shares placed in front, and at separate distances, according to the turf to be removed; these three shares are formed to cut their slices, and turn them over to the slices formed by the three shares which follow behind, and between the intervening spaces of the three first shares, whereby the work, when completed, will be left in ridges, with the sward sides of the slices facing each other.

RICHARD KINGDOM, M.D., Gothic House, Stockwell, Surrey, *certain improvements in apparatus for the support of the human body, and the correction of curvatures and other distortions of the spine of the human body*, Aug. 25.—The invention consists, first, in the use of two crutches or side-supports under the arms, and the mode of fixing the same.

Secondly, in doing away with the leather belt, heretofore worn round the waist, and to which the back supports to the spine have heretofore been fastened; also the method of fixing various new contrivances to stays, such as are usually worn by females.

The two crutches have two straps attached to the upper end, and crossing below the bosom, to be fastened to the two buckles, near the lower part of the busk, in order to aid in keeping the crutches upright; the lower end of each crutch is supported on a stud or pin, which rises from the centre of a metal pad, which is sewn into the stays so as to lie on the hips, and take the pressure of the crutch. There are straps crossing the back in various directions, the position of which will of course be varied according to the curvature of the spine in each particular case of application. That part of the crutch that goes under the arm, moves on a pivot joint, and the tongue-piece, which descends from the said pivot joint, is pierced with holes, for the purpose of adjusting it to the proper height; there being a spring with a stud in it, at the back of the socket, belonging to the shaft or side steel busk, which stud pulls out from, or takes into the last-mentioned holes.

The ordinary back-bar, in place of being attached to a belt, as heretofore, is fastened to the stays as follows:—Two steel busks or bars are introduced and sewn firmly into the stays, on each side of the lace holes; one end of the adjusting plate, belonging to the upright back bar, is rivetted to one steel bar, while the notches at the other end of the said adjusting plate take on to two headed studs, rivetted firmly into the steel bar on the opposite side of the lace-holes.

It is evident that by this improvement, the invalid will no longer be subject to the painful necessity of having a belt passed round the waist, which has always required, in order to steady it, the aid of two straps to pass round the thighs, to the great inconvenience and annoyance of the patient.

JAMES BEAUMONT NEILSON, Glasgow, *certain improved methods of coating iron, under various circumstances, to prevent oxidation or corrosion, and for other purposes*, Aug. 29.—The inventor claims the method of coating or covering iron, &c., by means of copper or alloys of copper, with zinc or tin. The copper or alloy is brought to that minute state of division in which it is obtained by precipitation from its solution, or it may be used in a granulated state. In order to cover cast-iron, sprinkle a thin coating of granulated, or other fine copper or alloy over the surface of the mould, to which may be added borax, or other flux, to facilitate the spreading or diffusion of the metal. Thus, when the molten iron is poured into the mould, the copper or alloy will be fused, so as to cover the casting, and render it secure against oxidation or corrosion.

If malleable iron is to be coated, put a covering of the pulverised copper or alloy over the upper surface of the iron, while it is being heated, and the borax or other flux will soon cause it to spread over the heated part, which should be plunged into water, to detach the scale of oxide that forms upon it.

RICHARD EDWARDS, of Fairfield-place, Bow, Middlesex, *improvements in preparing and combining materials used in lighting or kindling fires*, Aug. 29.—In the ordinary faggots of wood, used for lighting fires, there is not sufficient ventilation to allow the wood to burn, in case it be used in the close form of a bundle, but by this improvement, the pieces of wood are so combined with rope, cotton, paper, or other such like material, as to leave a space between each slip of wood or reed; thus it becomes what the inventor terms a "Ventilated Faggot," which may have its ends dipped into pitch, tar, resin, liquid sulphur, or other inflammable matter. By throwing one of these "ventilated faggots" into a fire-place, the coals may be heaped over it, and the servant, or other individual, will find no difficulty in causing the fire to burn after it is once lighted.

ROWLAND MACDONALD STEPHENSON, Upper Thames-street, civil engineer, for *an improved method or methods of adjusting, shifting, and working theatrical scenery and apparatus*, Aug. 29.—The object proposed by the patentee is the greater speed and facility with which stage scenery may be brought forward, shifted, or removed. The arrangement about to be described, provides means for shifting or removing simultaneously, and without noise, 35 distinct pieces of scenery, viz, 10 side scenes removed and 10 fresh subjects brought forward; five sets of clouds removed and five substituted, and five main scenes removed. The general arrangement of the machinery for effecting the above, may be described as follows:

The interior of the house between the basement and the roof may be said to be divided into four floors or compartments, viz., 1. a raised platform, on which the gearing for working the stage-traps is to be placed.

2d. The stage with traps of various forms and dimensions, including a considerable portion formed to rise or fall by suitable machinery, and called the sinking stage.

3d. The lower flats, between which and the stage are placed the wing scenes: between the framing formed by the girders and the supporting columns, and stretching from side to side of the stage, are suspended the border frames, which can be raised or lowered by means of ropes passing over drums and connected with counterpoise weights; and fourthly, the upper flats upon which the inventor places the moving power to communicate motion to the whole. On each side of the stage on the upper flat, are placed a series of frames called main scene carriages, having racks, which can be connected with pinions or long horizontal shafts when required to be moved backwards or forwards; these two shafts are connected at their extremities by a third shaft.

From the upper horizontal shafts, by means of bevel gear and vertical rods, on the lower ends of which are drums, an endless chain is driven horizontally in either direction, to which are attached the borders representing clouds, foliage, arches, &c. The side frames, of which the number is limited by the depth of the stage, may be either flat, circular, or triangular; in the present case they are triangular, and receive a forward, backward, or rotatory motion, or both at pleasure, and can be placed at any convenient angle to the audience, so as to represent closed doors, &c.; at every change of the scene they will be moved round 130 degrees, or one-third of a circle; the whole of the side frames may be moved together or separately, by means of gear connected with the moving power on the upper flat.

Attached to the centre of the border frames, and revolving on a pivot, are the traversing frames for crossing the stage in any direction, and at any given inclination; these, when ready for use, are raised up and secured at one end so as to form an inclined plane, and the object to be traversed having been attached to a wire passing round a drum fixed in a heavy frame, will descend by its own gravity.

The trap-frame consists of a rectangular platform traversing on the lower or fixed platform, and having an upright frame of iron mounted on rollers and capable of being traversed on the lower platform in any direction; when brought under the aperture in the stage, it allows the trap to be sunk steadily by bearing on a disc or square iron plate, counterbalanced by weights.

The claim is to the improved mode of shifting and working scenes and theatrical machinery, and to the obvious modifications of which the above arrangements are susceptible.

ENTERED AT THE PETTY BAG OFFICE, UP TO THE WEEK ENDING AUGUST 29, 1840.

(Continued from No. 57.)

ENGLAND.

WILLIAM MORRETT WILLIAMS, No. 1, Bedford-place, Commercial-road, Middlesex, *an improved lock and key*, Aug. 27.—This lock and key are constructed with peculiar and novel combinations of mechanism, intended to supersede the necessity of tumblers, as used in most of the patent locks at present known. On the lower edge of the bolt, a rack or series of teeth is formed; the end or tongue of the bolt is supported, and slides in a guide socket of the framing, and is guided in its sliding action by a screw that passes through a slot in the tail part of the bolt; a rack box is fastened to the lock plate,

immediately under the bolt, and a longitudinal groove is cut in the upper part of this rack box, in which the rack on the under side of the bolt is intended to slide. Four or more sliding pieces are employed in the lock, acting as guards, to prevent the bolt being slidden or moved from either its locked or unlocked position: these sliding pieces, with notches cut at different distances from their several faces, are to be inserted into the recesses or open parts of the rack box.

To the lock plate is fixed a forked spring, the ends of which fall into the perpendicular recesses or open parts in the rack box, and severally act against the faces of the sliding; these sliding pieces have each a tail or elongated part, which is intended to be passed through the face-plate of the lock. On the face-plate of the lock is affixed a socket-piece or key-guide, (which is a substitute for the key-hole), with holes for the tails of the sliding pieces to pass through, their extremities standing flush with the outside of the socket. The bolt is projected forward into the locking position by a lever acted upon by a powerful main-spring, and the bolt is slidden backward, or unlocked, by a feather spring, a sliding piece having an inclined plane being at that time pressed against a tooth on the side of the lever that is acted on by the main-spring; thus, by withdrawing this lever, the feather spring is allowed to throw back the bolt.

The key is formed by a rectangular box, which contains two series of pins or punches, of various lengths, fixed in a central box; the key box is mounted on an axis or pivots, which enable it to be turned over in its carriage or handle, so that either of the series of punches may be applied to the socket; one of the series of punches is for the purpose of unlocking, and the other for locking. When the sliders are in their quiescent state, the ends of the tails of these sliders are coincident, or flush with the front of the socket, but the notches on the several sliders are then at variable distances from the front.

It will be understood that the rack at the under side of the bolt, is continually in the longitudinal groove of the rack box, and it will be perceived that the several sliders in the recesses of the rack box at this time stand in the notches between the teeth of the rack, thereby confining and preventing the bolt from being moved along the groove. In order therefore to unlock, that is, to throw back the bolt, all the sliders must be first pushed into such situations as will bring their notches into exact coincidence with the groove in the rack box. This is to be done by applying the key to the face of the lock at the socket, and pressing it straight forward; the several plugs, punches of the key, being fixed in the block at different lengths, suited to the distances to which the sliders are to be moved; their pressure against the front ends, or tails of the sliders, will force all the sliders inwards, and cause their notches to be severally brought in coincidence with the groove: one of the sliders has an inclined plane to hold back the lever of the main spring; thus the rack of the bolt will be set at liberty, and the bolt will be immediately thrown back by the power of the feather spring.

In order to project the bolt into the locked position, the box of the key must be turned once, and the series of the pins or punches acting against the tails of the sliders, will push them back so as to bring all their notches into coincidence with the groove of the rack frame; when the power of the main spring acting against the lever, will cause the lock of the bolt to slide freely along the groove, and hence the bolt will be projected into the locked position. The withdrawing of the key will again allow the forked spring to force all the sliders into their quiescent situation.

The bolt may be moved to and fro, by an external button or thumb piece, without employing the main spring and driver, or the feather spring.

The same principle of construction is susceptible of some modifications, both in form and arrangement; the improved lock can also be adapted to the cock or tap of a cask.

In conclusion, it will be perceived that the object of this improved lock is to obtain security against picking, opening, or fastening, which depends on forcing or pushing all the stops or sliders, at one and the same time, from the front or outside of the plate, in order that the teeth or notches in the bolt may be released from the stops; for if any one of the sliders should, by a false key or other means, be pushed too far or not far enough to bring their notches into exact coincidence with the rack, the bolt must remain immoveable.

Railton.

GERAD RAILTON, merchant, Tokenhouse-yard, London, *improvements in rolling puddle balls, or other masses of iron, by employing a peculiar machine, for the purpose of compressing the iron into a state called bloom, preparatory to its being rolled into plates, or operated upon by tilt hammers*, Aug. 22.—The machine consists of a rolling cylinder, revolving on an axle within a strong iron frame; a toothed wheel is attached to each end of the cylinder, which is acted upon by pinions, to give it the necessary rotary motion. A segmental piece of iron is firmly fixed to the frame, embracing the cylinder, but in an eccentric position to the periphery of the cylinder; between this segmental piece of iron (which is semi-circular at the entrance) and the cylinder, the mass of iron passes in the form of a ball; a rotary motion being given to the cylinder, the mass of iron decreases in diameter, and increases in length, until it is delivered out at the bottom of the machine in the form of a roll.

The inventor claims, first, the entire machine.

Second, the mode of working the same in a horizontal position, if it should be found more convenient.

Third, by making masses of iron into balls, and then into rolls by one machine, either as the above or by substituting a piece of flat iron for the segmental piece, and having a second piece of iron wedge shaped, working on an axle in conjunction with the flat piece, which might be made to produce the same effect.

JOHN HANSON, Huddersfield, York, engineer *improvements in apparatus for measuring gas, water and other fluids, by employing an hydraulic valve or improved agent, as liquid packing, to prevent the gas passing from one chamber of the meter to another*, Aug. 22.—First, as regards gas meters generally. Naphtha, distilled from coal tar, or coal oil, is the packing medium or agent in hydraulic valves, for the purpose of preventing the gas escaping from one compartment of the meter to another.

Secondly, for measuring volumes of gas, passed through the same.

Thirdly, new machine for measuring volumes of water, or other liquids.

Fourthly, new construction and arrangement of slide cocks, or valves, by means of which the gas passes into, and fills one chamber, while the other is discharging, so as to produce an alternate receiving and discharging motion.

A chamber is constructed under the meter, as a small gasometer, and acts as a hollow piston, within another chamber, as its cylinder, and its edges descend into the naphtha or liquid packing, to prevent the escape of gas into any other chamber.

The valves, or slide cocks, are formed as cups on the end of levers, the fulcrum of which is immersed in the packing medium; the edges of the cups or valves descend alternately into the packing medium, and thereby close the aperture. A hollow weighted tube is mounted on a centre, and contains a metal ball which runs freely inside, both ends being closed; on the top of this weighted tube are fixed two forks, which act alternately on the right angle lever connected withthe valves. A tappet piece is fixed to the top of the moving chamber, and as that rises, the tappet piece raises the end of the weighted tube, thereby causing the ball inside to roll to the other end, and one of the forks on the top to come in contact with one of the short arms of the lever, and to shift the valves. A rod is fixed to the moving chamber to guide its motion, which rod is covered with an air-tight cap-piece. The ascent of the moving chamber being caused by the expansive force of the gas, another rod is fixed to the under side, to the end of which is connected a balance weight, by a chain working over a pulley, to regulate the descent of the chamber, and thereby prevent any difference in the lights upon the shifting of the valves. The registry required will be of the number of movements of the valves; the movement may be taken from the fulcrum, by a train of toothed wheels, dials, indices, &c., as usual.

New machine for measuring water or other liquids.—By having two measuring chambers fixed on one bottom-plate, with a rocking motion, a valve is formed at the bottom of each with a projecting rod. A float, fixed on a lever, turning on proper bearings, and resting on a stationary pin, is placed near the top of each, with a projecting piece abutting against a stop (which is regulated by a screw), which holds up the side containing the fluid, until it has raised the float from off the stationary pin, which action causes the lever to which the float is fixed, to throw off the hold of the abuttment on the stop, and its weight causing it to descend, the other side, or empty vessel, is secured in like manner, whilst the projecting rod coming in contact with a stop piece placed underneath the valve, is opened, and the vessel is emptied whilst the other is being filled, which acts in a similar manner. The registering movement may here, as in the gas meters, be taken from the fulcrum; and the quantity calculated by finding the number of movements, knowing the cubic measurement of the vessels.

NOTICE.

In accordance with the determination expressed in our 26th Number, of giving one month's clear notice to Inventors, before publishing their specifications, we hereby inform the following Patentees, that their specifications will be published in the "INVENTORS' ADVOCATE" of Oct. 10. Each party will receive, in addition, a *private* communication to the same effect.

Henry Kirk, Upper Norton-street, Portland-place, merchant, due Sept. 28.
John Bethell, St. John's-hill, Wandsworth, due Sept. 28.
Claude, J. E. C. Junot, Brewer-street, Golden-square, operative chemist, due Sept. 30.
Henry Martin, of Morton-terrace, Camden Town, due Sept. 30.
William Neale Clay, of Flinsby, Cumberland, due Sept. 30.
John L. Steinhaneser, Upper Islington-terrace, due Sept. 30.
Peter Bancroft, of Liverpool, merchant, and
John M'Innes, Liverpool, manufacturing chemist, due Sept. 30.
Charles Cummins, Leadenhall-street, chronometer maker, due Oct. 2.
James Stead Crosland, of Leeds, engineer, due Oct. 2.
Thomas Smedley, Holywell, county of Flint, due Oct. 4.

FOREIGN PATENTS.—FRANCE.

FIRST QUARTER OF 1839.

A LIST OF PATENTS GRANTED BY THE FRENCH GOVERNMENT FROM MARCH 12, TO 30, 1839.

(By Royal Decree, dated Aug. 26, 1839.)

(Continued from No. 57.)

118. Guerineau Favre, Louis Porchaire, represented by Mendes, addition to patent for 10 years, dated Nov. 29, 1838, for *melting and refining tallow by steam*, March 12, 1839.

119, Haddan, John Coope, and Johnstone, John, represented by Perpigna, 10 years, for *improvements*

in apparatus for heating and ventilating apartments, houses, and other buildings, March 12, 1839.

120. Herbinot, Claude Martin, 5 years, for *a new lock*, March 12, 1839.

121. Hoyau, Louis Alexandre Désiré, second addition to patent for 15 years, dated Feb. 2, 1827, for *a machine for making clasps*, March 12, 1839.

122. Marquis de Jouffroy, Achille François Léonor, 15 years. for *a mechanical apparatus, by means of which steam power is rendered applicable to ships and vessels used for navigation, without depriving them of any of their advantages, and without any alteration in their form, rigging, sails, and cordage*, March 12, 1839.

123. Kestener, 5 years, for *a new system applicable to various kinds of constructions*, March 12, 1839.

124. Moinier, Legoux, represented by Perpigna, 5 years, for *reducing to pulp wood-shavings, bark, roots, leaves, gramineous substances, reed, the pulp of tubereulous and leguminous roots, wheat, straw, hay, herbs, moss, uquatic herbs, marine plants, and in fine all vegetable substances, by means of mechanical apparatus and of new chemical processes, or of new applications thereof; the said pulp being for the purpose of manufacturing therefrom every kind of paper, eard, and paste-board*, March 12, 1839.

125. Pillard, Philibert, 5 years, for *a process of rendering silk hats waterproof, and impervious to perspiration*, March 12, 1839.

126. Poole, Moses, represented by Truffaut, 10 years, for *apparatus or vessels for the purpose of filtering liquids*, March 12, 1839.

127. Poole, Moses, represented by Truffaut, 10 years, for *improvements in looms for spinning and doubling cotton, flax, wool, silk, and other fibrous substances*, March 12, 1839.

128. Simon, Nicolas, 10 years, for *an economical portable stove*, March 12, 1839.

129. White, James, represented by Truffaut, 10 years, for *improvements in the construction of looms for preparing and spinning the refuse of silk, either pure or mixed with wool, flax, and other fibrous substanees, &c.*, March 12, 1839.

130. Ajasson, Jean Baptiste François Etienne, 15 years, for *the use of a substance almost as hard as the ruby for the purpose of making plummer-blocks of steam and other engines, boxes for naves of carriage and other wheels, pulleys in general, rings for ships' cordage, &c., crapaudines for the pivots of gates, &c., and utensils used in chemistry and the arts*, March 22, 1839.

131. Arrault, Henri, and Sotteau, Louis Jacques, addition to patent of 5 years, dated Feb. 19, 1839, for *a bitumen called by them iron bitumen or mosiac iron bitumen*, March 22, 1839.

132. Bergeron, Pierre, 15 years, for *a new axletree for carriages*, March 22, 1839.

133. Bonnard, Arthur Charles, second addition to patent for 15 years, dated March 28, 1837, for *a moveable permanent and portable cupping-glass, to be applied on part or the whole of the body and mucous parts, and procuring compression by the accumulation of any kind of gas in the interior. By means of this modified apparatus, the inventor establishes portable baths, action on the skin, &c., &c.*, March 22, 1839.

134. Buran, Edouard, represented by Reynaud, 5 years, for *new means of extracting sulphur from pyrites and other sulphates*, March 22, 1839.

135. Carette, Jean Pierre, 5 years, for *hangings of apartments on moveable frames*, March 22, 1839.

136. Cornu, Eugene Alfred, 10 years, for *machinery for increasing the power of steam-engines, or of any other motive power on land or sea*, March 22, 1839.

137. Detrand, Pierre Paul, 5 years, for *a sedan chair for raising a sick man out of bed and laying him on another, for transporting him from one place to another, and without touching him, enabling him to take steam and other baths, and placing him in any desired position*, March 22, 1839.

138. Doguin, son, Michel, 10 years, for *a machine for manufacturing every kind of lace, of any pattern, as likewise bobbin-net, with any kind of stuff worked into the lace*, March 22, 1839.

139. Elkington, George Richard, represented by Truffaut, 10 years, for *various processes of silvering metals, and of covering those susceptible of it with a layer of zinc, in order to preserve them from oxydation*, March 22, 1839.

140. Lhomme, François, addition to patent for 10 years, dated March 1, 1839, for *a new arrangement of iron stairs*, March 22, 1839.

141. Marquis de Louvois, addition to patent for 10 years, dated June 13, 1837, for *a simple and economical method of rendering rapid rivers and torrents navigable in times of drought by means of a moveable bar with narrow channels and revolving locks*, March 22, 1839.

142. Mareschal, Jules, and Co., second addition to patent for 15 years, dated March 31, 1838, for *a method of arranging substances in an air tight filter, of withdrawing and tapping them, when submitted to any degree of pressure, produced either by a vertical column of liquid, or by hydraulic pumps, presses, by steam or atmospheric pressure, when the equilibrium is destroyed by a vacuum, or by any machine capable of producing pressure*, March 22, 1839.

143. Mothes, François Barnabé Achille, addition to patent for 10 years, dated March 27, 1838, for *a pharmaceutical preparation called "alimentary and pectoral jelly,"* March 22, 1839.

144. Paulet, George, second addition to patent for 5 years, dated Aug. 8, 1838, for *a process of refining sugar and of extracting that which remains in molasses*, March 22, 1839.

145. Petys, Jean Constant, addition to patent for 15 years, dated Oct. 31, 1836, for *a mechanical apparatus for sculpturing and inlaying, adapted to finishing all works of sculpture, mosaic and marquetry, in marble, fine wood, or any other substance*, March 22, 1839.

146. Whitaker, Jérémie, 10 years, for *the manufacture of artificial leather to be used instead of animal leather for the forms of cards*, March 22, 1839.

147. Jalasson, Jean Dominique, represented by Perpigna, 5 years, for *a new binding with moveable metallic covering*, March 27, 1839.

148. Moreau, Felix, 5 years, for *artificial reliefs and sculptures by inlaying and incrusting marble with other mineral substances, but perfectly identified with it*, March 27, 1839.

149. Vve Petit and son, represented by Perpigna, 15 years, for *improvements in stocking frames*, March 27, 1839.

150. Robertson and Co., 5 years, for *processes of compounding and preparing artificial cart grease*, March 27, 1839.

151. Selligue, Alexandre François, addition to patent for 10 years, dated Nov. 14, 1838, for *the application of mineral oils to illuminating purposes*, March 27, 1839.

152. Suchon, Jean Marie, addition to patent for 5 years, dated March 8, 1839, for *clarifying and filtering common water for domestic purposes, factories &c.*, March 27, 1839.

153. Vaux, Christophe, by Perpigna, for 10 years, for *one or several new methods of restraining and diminishing the injuries resulting from the shock or violence of the waves of the ocean, and of reducing them to the comparatively harmless state, known by the name of broken water, and by this means of preventing all damage to breakwaters, moles, jetées, fortifications, dykes, fixed or boat bridges, and also of increasing the security and defence of ports, roads, anchorages, and other localities exposed to the violent action of the waves*, March 21. 1839.

154. Benoît Dulaurier, Jean Pierre, 5 years, for *a new method of constructing railroads*, March 30, 1839.

155 Carville, Charles Louis Joseph, 10 years, for *a brick-making machine*, March 30, 1839.

156. Guyot, Jean Marie, 5 years, for *a small light acoustic car-trumpet, regulated by means of a screw which closes or opens the apparatus*, March 30, 1839.

157. Laurent, Camille, addition to patent for 15 years, dated Nov. 14, 1838, for *a new arrangement of electro-magnetic machines*, March 30, 1839.

158. Lutcaud, Etienne, 5 years, for *a new press*, March 30, 1839.

159. Manin Luce and Co., addition to patent for 5 years, dated Oct. 20, 1838, for *an apparatus with continuous jet, moveable piston, and stone valves called by them neoclysopompe*, March 30, 1839.

160. Martin, Emile, 10 years, for *the production of economical illuminating gas*, March 30, 1839.

161. Rousseville, Aimé François Alphonse, for 10 years, for *a metallic alloy resembling silver, called "wolfram," adapted to the manufacture of covers and other objects of domestic economy, such as tea-pots, plate, and generally all articles of pottery*, March 30, 1839.

162. Seaward, John, represented by Bloqué, 10 years, for *improvements in condensing steam-engines*, March 30, 1839.

163. Vauquelin, Louis François, 10 years, for *mechanical processes applied to the currier's art*, March 30, 1839.

End of 1st *quarter of* 1839.

FOREIGN CORRESPONDENCE.

BELGIUM.

PUBLICATION OF PATENT SPECIFICATIONS IN BELGIUM.

The new Minister of the Interior, observes the *Fanal*, "appears to be desirous to remedy the violations made by his predecessor in the law of patents. He no longer attends blindly to the recommendations of his *Adviser*, by doing which his predecessor placed many patentees in great embarrassment, as he told them it was immaterial whether they took out a patent of invention or of importation, as the same rights and the same protection accompanied each. But the difference between the importers of the inventions of others, and of original inventors, is this,—that certain conditions are imposed on the former from which the latter are exempted. The *Adviser* committed another absurdity. He persuaded M. de Theux that the patents ought to be kept secret until they expired; and according to that advice, M. de Theux would not permit any persons to examine the specifications of patents, in order to prevent them from taking out patents for the same in other countries. We urged for a long time, but in vain, that all concealed patents have no more legal value than a decree which has not been promulgated; and that no tribunal would condemn the infringer of an invention, who could with justice say he was ignorant of the law against which he was charged with offending; for no law can be violated which does not exist, and no law exists without having been published. The Minister ordered a report to be made on the subject, after our representations, by a commission composed of the *Adviser* alone; who then first agreed that the specifications should not be concealed for more than a year, and afterwards that the period of concealment should be not more than a month. But we contend that they ought not to be concealed a single minute, and that, too, for the sake of the *Adviser* himself; who might be suspected of wishing to profit by the knowledge which he alone possesses of the new patented inventions. The wise measure which the

new Minister of the Interior has taken, shows that he intends to destroy a number of other abuses which we have not failed to point out. This encourages us to return to the charge, and we will return."

The *Independent* says that the measures proposed by the Minister of the Interior for the assistance of the linen manufactures, until the results of the commercial inquiry into the causes of its depression are known, are about to be immediately adopted in West Flanders. "On the first proposition made to the Minister by the permanent deputation from the council of that province, he authorised them to order frames, looms, shuttles, and other machinery employed in the linen manufacture, to a considerable amount. This machinery, constructed after the most improved models, will be distributed, under the direction of the local authorities, to those weavers and spinners, who, by their laborious habits and their poverty, seem most deserving of such encouragement. The same measures will probably be soon adopted in East Flanders. We are informed also that the Minister of the Interior has requested the National Association to co-operate in assisting the linen manufactures of the country by the distribution of encouragement of a similar kind."

GERMANY.

A letter from Leipsic, dated the 18th ult., states that the ceremony of opening the railway from Magdeburgh to Leipsic, which has been completed for the whole distance, took place on the preceding day. The whole population of Leipsic was on the *qui vive* on the occasion. Most of the shops were closed, and the numbers of persons assembled are estimated at forty thousand; who collected in the neighborhood of the railway station. At noon the train, containing the burgomaster, several of the senators and other persons of distinction, consisting of five carriages, drawn by the locomotive the *Leipsic*, arrived from Magdeburgh, and was saluted with salvos of artillery. In a few minutes afterwards, two other trains arrived consisting of forty-two carriages, drawn by three engines.

Steam navigation on the Rhine increases every year. One steam boat alone, belonging to the Cologne company, conveyed 20,000 passengers in the months of June and July. The traffic on the railroad from Frankfort to Mayence is also improving. During last July it conveyed 95,907 passengers; and the number conveyed by this railroad from the 26th September, 1839, when it was partially opened, to the 31st of last July, amounted to 415,000.

FRANCE.

The works on the railroad to Versailles (on the left bank) are nearly completed. The road is levelled and the rails are about to be laid down, and it will soon be in operation.

The scientific commission in Algeria has brought its first campaign to a close. It will not recommence its labors before the end of September. The intermediate time will be occupied in arranging their discoveries and preparing their observations for publication.

EAST INDIES.

BOMBAY IMPORTS AND EXPORTS.

The recently published abstract of the value of the external commerce of Bombay, during the last four years, strikingly exhibits the effects of the crisis in China upon the commercial prosperity of the presidency. Whilst the imports into Bombay from Great Britain have, in the years 1836-7-8-9, and 1840, fluctuated between the totals of Rs. 11,177,650 and 13,864,408 (the latter amount being for the year 1840), the imports from China for the same periods have fluctuated between Rs. 15,215,793 and Rs. 4,050,589. The former amount is the estimate for 1837-8; the latter ditto for 1839-40; showing an immense falling off. The grand total of imports into Bombay was, for 1836-7, Rs. 47,245,571. There has been since a gradual fluctuation, and in 1839-40 it stands at Rs. 34,335,342. The general imports from other places than Great Britain and China have fluctuated, during the above years, between Rs. 16,420,345 and 19,923,709; the lowest estimate is for the year 1839-40. The exports from Bombay to China have fallen off in one year, from Rs. 26,685,034 to Rs. 6,322,405; the latter being the amount for 1839-40. In other respects an equality has been maintained in the exports; and in the aggregate the exports are similar in amount to the imports. A glance at the statement of the amount of treasure imported into Bombay during the same period (1836 to 1840), shows how much the trade of the island must have been depressed by a scarcity of the circulating medium, owing to the diminished supplies of the precious metals from China: the distress of Bombay has been doubtless augmented by the conduct of the Bengal Government in wantonly withholding from circulation—for several months of the busiest season, actually, and more than twelve months, virtually—the capital stock of the Bank of Bombay.—*East India Telegraph.*

NEW ZEALAND.

Despatches from Col. Wakefield, bearing dates from Feb. 27, to April 6, have reached the New Zealand Company, by the Portland *viâ* Sydney. They communicate the fact of the site of the first town having been definitely fixed at the place originally named, Thorndon, situated on the banks of the inner harbour on the west side of Port Nicholson, called Lambton Harbour. When Colonel Wakefield first visited Port Nicholson in September, he selected this as a most desirable place for a town; the land about it being almost cleared, the site advantageous for laying out a town, and for its appearance, and the landing and anchorage close to the shore being excellent, and so as to enable vessels to discharge at all times, and under all winds, with facility. It appears, however, that the surveyor-general, who arrived at Port Nicholson during the unavoidable absence of Colonel Wakefield, in consequence of the accident to the Tory, formed an opinion that the proper site of the future city was the lower end of the valley of the river Hutt, so that the rural sections might extend behind it up the river. On Colonel Wakefield's return, he found the surveyor-general had landed the company's stores and surveying staff, and had commenced the surveys near the Hutt; but he refrained from interfering with the surveyor's selection, until, at all events, he should be able to ascertain the colonists' opinion upon so important a point. A strong feeling displayed itself among many of the colonists in favor of Thorndon; and Colonel Wakefield called a meeting of the landholders for the purpose of laying before them the opinion of the surveyor-general, and ascertaining their wishes. The meeting, however, could not come to a specific resolution in favor of either site, but expressed a wish that half the town acres should be taken at either place; thereby risking the immediate establishment of two rival towns. This expedient, Colonel Wakefield declared wholly inadmissible, as fraught with obvious injustice to the purchasers at the preliminary sale. But the feeling of the colonists in favor of Thorndon growing gradually stronger, Colonel Wakefield, after full communication with the surveyor general, having found that the expense of the requisite precautions against inundation, the comparatively bad anchorage and transit, and the probable delay in the surveys from the intersection of the river, remained strong, and, to him, insuperable objections, took on himself the responsibility of removing the site to Thorndon; and, on the 4th of April, gave the order for the surveys to proceed in that locality accordingly. There is at Thorndon (the future Wellington) a level surface of 500 or 600 acres, with gentle eminences on which residences may be erected; and a road along the beach may be made with little difficulty to the mouth of the river. There is no large stream of water flowing through it, but the wells are amply supplied at a small depth from the surface. It appears, not only from Colonel Wakefield's despatches, but from private letters, that the final arrangement has given general satisfaction to the colonists. The committee of the colonists were taking steps to obtain the sanction of the native chiefs to measures for the maintenance of order—that is, they called in the aid of the sovereign power of the country (the sovereignty of that part of New Zealand not having been yet acquired by the British crown) to confer a legal character upon their proceedings. According to a private letter, the committee (who styled themselves the council) had met and performed some acts for the preservation of order, under native authority.

The intelligence by this arrival is highly satisfactory. The colonists are delighted with the country and their own prospects. Several ships had reached Port Nicholson from Sydney and Port Phillip with emigrants and live stock. Mutton was selling at 1s. per pound, and fresh pork at 6d. Potatoes of a very fine quality were abundant. The branch bank of the Union Bank of Australia was in full operation, and the second number of the *New Zealand Gazette* (the first having been published in London before the departure of the colony) was to be published on the 11th April, the printing materials having been landed, and an office established in a tent.—*Colonial Gazette.*

RAILWAY INTELLIGENCE,

DOMESTIC AND FOREIGN.

Blackwall Railway.—On Sunday, about half-past five o'clock, the rope which was drawing the train from the Minories to Blackwall broke about the middle of the way. No injury was done to any of the passengers.

Bristol and Exeter Railway.—The half-yearly meeting of the proprietors in this undertaking, took place on Wednesday, in the Merchants' Hall, and was numerously attended; Frederick Ricketts, Esq., Chairman of the Board of Directors, presided. The financial statement exhibited in the report, gives the following results:—The product of the nine calls, amounting to £50 per share, on 13,945 shares, including £8,097 10s. received on 1,056 forfeited shares, was £539,122 10s.; deposit in anticipation of calls, £2,422 19s.; transfer certificates £158 15s. Total receipts to 30th June, £541,704 4s. Due on 1st and 2d calls, £50; on 3d, £4,545; on 4th, £10,615; 5th, £13,115; 6th, £16,855; 7th, £17,805; 8th, (£10), £10,660; 9th (£10 due 6th of May last), £63,200. Total, due on calls, £166,225. Amount on arrears or calls received during last half-year, £62,580. Since 30th June, £25,866 5s. has been received for calls and interests thereon.

Expenditure—Total expenditure to 31st Dec. last, £397,561 5s. 6d.; this last half-year, £119,378 3s. 10d.; of which the purchase of land, &c., was £6,767 11s. 6d. Payments to contractors, £86,286 16s. 6d. Timber for permanent way, £18,822 1s. 1d.

Balance in the hands of bankers and secretary, £22,264 14s. 8d.

Towards the close of the meeting, T. Powell, Esq., moved a resolution, which was seconded by Mr. Fussell, expressive of the satisfaction of the meet-

ing that Dartmouth had been selected as the West India packet station.

The usual votes of thanks were then passed, and respectively acknowledged.

Midland Counties Railway.—The fourth general annual meeting of the proprietors of this company was held in the Board-room of the Station, at Leicester, on Monday, the 31st of August. Thomas Edward Dicey, Esq., chairman of the Board of Directors, presided.

The following are extracts from the report:—

"It will be observed, from the accompanying accounts, that the gross receipts to the 27th of June were £20,071 14s. 8d., and the disbursements, including all the heavy extra items consequent upon the successive openings of the line, are not more than £11,320 15s. 8d., and it is with peculiar pleasure that the directors call attention to the fact, that the exact and entire expenses of the locomotive power, during the last six months, amount to no more than sixteen pence per mile; a rate, they believe, below that on any line of the same extent, where the price of coke is as high as they had to pay during the greater part of that period; and it is now much reduced in price.

"The net profit of £8,767 17s. amounts to nearly 5 per cent. per annum on the cost of that portion of the railway on which it has been almost wholly earned.

"The audited balance sheets, and particulars of the income and expenditure, will be submitted to the meeting.

"Into any lengthened history of the attempt now making by the Birmingham and Derby Railway Company to divert the traffic between London and Derby from this, the direct line originally authorised by Parliament, and to force it along an indirect and circuitous line, possessing no advantages whatever over that of the Midland Counties, but, on the contrary, being about eleven miles further round, the directors do not think it at all necessary to enter, notwithstanding the unwarranted representations which have been studiously made with respect to this proceeding, and the entire suppression in the report just published by the Directors of the Birmingham and Derby Company of the extraordinary means adopted to deprive this company of part of their traffic."

In conclusion, the chairman assured the honorable proprietors and the meeting, that as they had not provoked hostility, so it should never be intentionally kept up. They entertained no unfriendly feeling towards the Derby Company, and the moment they could adopt a different course to that which they recommended, with reference to the interests of this company, they would gladly do so.

Great Western Railway.—Crowds of spectators are every day attracted to the works at the "Skew Bridge," over which the Great Western Railway is to pass the Avon. The cast-iron standards for the support of the road-way, and the longitudinal timbers on which the permanent rails are to be laid, are nearly all in their places. The masonry on each side of the water is now almost completed. The depôt could not be finished in time for the opening on Monday, but temporary offices are being rapidly constructed. During the past week, several experimental trips have been made by the directors, accompanied by Mr. Brunel; and large quantities of timber, and other materials required for the works, have been conveyed from Bristol to Bath by one of the company's powerful locomotive engines. Relays of men are now employed on the works night and day; not a moment is lost at meal times, for the instant one man lays down his tools for the purpose of taking refreshments, another supplies his place. At the Bristol terminus, everything proceeds in the most satisfactory manner. Several fresh arrivals of carriages have taken place within the last few days, and we understand that there are now about 40 on the line; those belonging to the first class being fitted up in the most splendid manner.—*Bath Chronicle.*

Great Western Railway Meeting.—The 10th half-yearly general meeting of this company took place on Thursday the 27th ult., at Bristol, in the Merchants' Hall, CharlesRussell, Esq., in the chair. From the report of the directors, and which received the sanction of the meeting, it is intended to create 37,500 shares of £20 each, which will produce a sum of £750,000; offering to each proprietor one new share at par, in respect of an original £100 share, or two half shares of £50 each. It is intended to call for £4 per share on each of these 37,500 shares, and apply it in the redemption of £150,000 of outstanding mortgages. The remaining £16 on these additional shares to be called for in order to pay off the mortgages.

The sum of £600,000 is to be borrowed on loan notes, to bear interest at the rate of five per cent., subject to a covenant of discharge of the said loan notes at fixed periods, either in cash, or in the new mortgage debentures, at the option of these holders of the loan notes, to be declared one month before its maturity.

According to the general abstract of expenditure, it appears that to the 30th of June the sum of £4,508,160 have been expended.

The amount of receipts for the last half year is £86,522 17s. 6d., for the conveyance of passengers, mails, and goods, and an extra item of £1,749 15s 6d. for the carriage of timber and materials for the line, making a total for the whole half year of £89,937 9s. The cost of maintaining the locomotive department, also the maintenance of way between London and Steventon, wages to guards, conductors, police, &c., repairs at stations, government duty on mileage, and salaries, &c. of various servants, with other similar costs, amount altogether during the half-year to the sum of £43,749, being nearly in the proportion of 48 and ¾ of the gross receipts. This leaves the net balance of receipts over cost of maintenance for the half-year £46,188.

According to the report of Mr. Brunel, submitted to the meeting, it is expected to complete the line to the turnpike road between Swindon and Wootton Basset in the early part of November; and it is hoped that the whole line may be opened in the course of 12 months from the present time.

It was proposed to make a dividend from the amount of revenue in hand. However, the proposition was abandoned, it being considered likely to embarrass the financial arrangements of the directors in issuing the new shares.

Mr. Aiken moved a resolution authorising the directors to grant the fee of the land for building a church, and enforced it by several powerful arguments.

The motion having been seconded, a long discussion followed, in which Messrs. Heyworth, Tothill, Fry, Hall, Harley, C. B. Fripp, and others, took part. It was contended by some of the proprietors, that the company could not legally grant the land for the purpose of building a church, nor for any other purpose not contemplated by the act. Other shareholders contended that if the land was granted for building a church, other applications would be made by Wesleyans, Unitarians, and Roman Catholics, for land on which to build chapels in their connections, and that on the same principle they could not be refused. It was then proposed that the motion should be withdrawn, and that a paper should be sent round for receiving the names of such gentlemen as chose to subscribe for the purpose of purchasing the land of the company, and afterwards appropriating it to the object intended by the motion before the meeting.

A protracted conversation followed this proposition, in the course of which the directors declined to withdraw the resolution, as it had been come to by them after much deliberation. It was ultimately left to Mr. Aiken to do as he thought most advisable under the circumstances; and that gentleman, on the understanding that the company should be allowed to sell the land for the contemplated object, and that the purchase would be made by the subscriptions of proprietors, consented that the motion should be withdrawn.

Votes of thanks were then passed to the chairman, the board of directors, and the Society of Merchants for the use of the hall; and the meeting broke up.

Great Western Railway.—Opening between Bath and Bristol.—Bristol, August 31.—The public opening of the Great Western Railway, between this city and Bath, took place this morning. The first train, conducted by the Fire Ball engine, was announced to start at eight o'clock, but did not fairly leave the station until nearly a quarter of an hour afterwards, when it took its departure amidst the hearty cheers of thousands of spectators whom the novelty and importance of the occasion had drawn together. The engine was not at any time put to her speed, as it was considered advisable, in consequence of the crowds of country persons who at different points were crowding close upon the line in order to catch a view of the passing trains, to proceed with more than usual caution: the steam whistle was therefore put in constant requisition, and the train proceeded at a medium pace, the time actually consumed in traversing the 12 miles (excluding a stoppage at Keynsham station, which occupied about four minutes), being 32 minutes. Later in the day, a much higher speed was obtained. The trains were well filled at every trip, both to and fro, and it is calculated that nearly 6,000 persons have traversed the distance. The day has been celebrated here by the ringing of bells, firing of cannon, &c.

Leeds and Manchester Railway.—We have the pleasure to announce, that this railway is so far advanced that the communication between Leeds and Hebden Bridge will be opened on the 1st of October next, when the whole journey from Leeds to Manchester may be travelled by railway, with the exception of 10 or 11 miles, namely, from Hebden Bridge to Littlebro'. The only obstacle in the way of the communication from Leeds to Hebden Bridge, at present, are those comprehended in the Kirkthorpe and the Cooper Bridge and Thornhill contracts; and Mr. M'Intosh, the contractor for the former, and Mr. Tomkinson, the contractor for the latter portion of these sections of road, report that they shall be ready for the passage of the railway carriages at the time we have mentioned, namely, on the 1st of October. It is understood that in a month or six weeks from that time the line from Hebden Bridge to Littlebro', including the summit tunnel, will be completed, and the whole line opened for the conveyance of passengers.—*Leeds Mercury.*

Brandling Junction Railway Company.—The above company recently held a half-yearly meeting, at which a report was made by the directors, setting forth the success which has hitherto attended the line, and the gratifying prospect of increased prosperity in the future. The steady advance in the revenue of the company, as shown in the table which we published last week, was adverted to by the directors in terms of congratulation; and they expressed an opinion (in which they are clearly justified,) that so long as the trade and population of the district continue to increase, there will be a corresponding increase in the business of the railway, and a consequent remunerating rate of interest for the proprietors. With regard to the progress of the works, the directors referred to the chief engineer's report, showing how far the line had been extended into the western district, where the quality of the coal commands a sale under any circumstances, and whence the company must derive a certain and (it may be) a rapidly increasing amount of revenue. A contract (they added) had been made with the owners of Tanfield Moor colliery, for the conveyance of the whole of their coals from November next; and Marley Hill and Andrew's House collieries had also been brought upon the line. Another source of income had been acquired by the construction of a short branch, connecting the line with the Stanhope and Tyne Railway, so as to afford a new channel of communication from Gateshead, Sunderland, and Shields,

to Durham, Stockton, Middlesbrough, Darlington, &c. The Directors had it in contemplation to render this communication more perfect at a future day; and the success which had attended the present comparative experiment, in the increase of traffic in goods and passengers, held out a cheering prospect of the results of projected improvement. The directors concluded by an anticipation of advantages fiem the completion of the great London lines northwards; and a dividend was declared of three per cent. for the half-year ending June 30, with an intimation that a like dividend would, in all probability, be declared for the half-year ending December 31.—*Gateshead Observer.*

Southampton Railway.—Power of the Steam-engine.—The one o'clock train was proceeding from Southampton on Friday, when near Wimbledon the machinery of the engine became accidentally injured, and the train (a very long one) was consequently unable to proceed to its destination. In about half an hour the next train came up, and the one engine then actually propelled the two trains at the rate of twenty miles an hour, consisting of 35 trucks, upwards of 500 passengers, the incapacitated engine, seven gentlemen's carriages, and six horses.

Fire on the Southampton Railway.—On Thursday, as the luggage train which leaves London at 12 o'clock for Southampton was within three miles of Basingstoke, one of the wagons was discovered to be on fire. The guard immediately signalised the engineer, and the train was stopped. There being no water, the men subdued the fire with their hands and feet, which they accomplished in a very short time. The damage done will not exceed £50.—*Southampton Independent.*

Another Accident on the Southampton Railway.—*To the Editor of the Times.*—Sir,—I have just read your observations in this day's paper on railway accidents, written with your usual ability, and characterised by the interest you invariably show in the safety and comforts of the public. In illustration of the carelessness and wilful neglect of the officers on the *Southampton Railway*, I will mention an accident that happened to myself yesterday, and which might have been attended with great loss of life. Owing to the inspector at the Weybridge station having neglected to adjust the points of the rail, our engine was forced off the rail, and the wheels buried above a foot deep in the road; thus, not only occasioning a delay of three hours to our London train, but, by our engine having been thrown across the down rail, the passengers to Southampton were kept for more than an hour and a half at Weybridge, many of whom would thereby arrive too late for the Oriental steam-ship, to which they were bound by a particular hour. This, and many other accidents on this railroad, I attribute to the culpable avidity of the directors, in reducing the number of proper officers, and in underpaying those whom they have retained. I am, yours, &c.,

Sept. 2. Viator.

More Railway Accidents.—Yesterday morning, on the Grand Junction Railway, as the three o'clock down train was proceeding with great velocity near Hartford, Cheshire, one of the engine wheels came off by the tire not being secured. The engine then went completely off the rail, drawing the carriages with it, and imbedded itself in tho earth. One gentleman, Mr. John Fortescue, had his right arm severely lacerated, and a lady named Ponsonby, received serious contusions on her head by being thrown with great force to the opposite side of the carriage, and all the other passengers were more or less injured. On the London and Birmingham Railway, the same night, another accident occurred by some of the trucks being left by neglect on the rail about nine miles from Birmingham, occasioning the engine to traverse, and with it the carriages to which it was attached, but happily without the loss of life, although the concussion was tremendous. After a detention of two hours, a special train was sent on with the passengers and mail to Manchester and Liverpool.—*Times*, of Wednesday.

The Cause of Fires on Railways.—It was stated at the meeting of the Great Western Railway shareholders at Bristol, on Thursday, that the probable cause of the recent fires on that line was the hot ashes being thrown up by the wheel from the ash-box on to the tarpaulin, which was set in a flame, and from its combustible nature, when once on fire, rather assisted than prevented the destruction of the property which it covered. On this discovery the wheels of the engines for the conveyance of goods were plated, thus affording a preventive of a recurrence of fire from the same cause.

Increase of Railway Traffic in August.—The following table of passenger traffic, showing the traffic per mile per day, in August last year, and in the present year, shows an increase of traffic in every case. It must be observed that the traffic and mileage on some of the lines is calculated with regard to the distance run on other lines:—

Length.		1839.	1840.
112	London and Birmingham	$14\frac{3}{4}$	$21\frac{1}{2}$
$97\frac{1}{4}$	Grand Junction	12	13
$72\frac{1}{4}$	North Midland	—	7
$76\frac{1}{2}$	South Western	(58 m. $6\frac{3}{4}$)	$14\frac{3}{4}$
63	Great Western	(31 m. $11\frac{3}{4}$)	13
$60\frac{1}{2}$	Newcastle and Carlisle	$1\frac{3}{4}$	$2\frac{1}{2}$
57	Midland Counties	(15 m $2\frac{1}{4}$)	$4\frac{1}{4}$
47	Birmingham and Derby	$2\frac{1}{4}$	$3\frac{1}{2}$
37	North Union	$3\frac{3}{4}$	—
31	Birmingham and Gloucester	—	$5\frac{1}{2}$
31	Hull and Selby	—	$4\frac{1}{2}$
31	Liverpool and Manchester	$17\frac{1}{2}$	$19\frac{1}{4}$
31	Great Western	$11\frac{3}{4}$	—
27	York and North Midland	—	9
20	Leeds and Selby	$4\frac{3}{4}$	—
$19\frac{1}{2}$	Preston and Wyre	—	$4\frac{3}{4}$
$17\frac{1}{2}$	Eastern Counties	($10\frac{1}{2}$ m. $4\frac{3}{4}$)	7
16	Dundee and Arbroath	$2\frac{3}{4}$	—
16	Durham and Sunderland	1	—
$15\frac{1}{2}$	Midland Counties	$2\frac{1}{4}$	—
$13\frac{1}{2}$	Manchester and Leeds	$6\frac{1}{4}$	7
$10\frac{1}{2}$	Glasgow and Ayr	—	—
$10\frac{1}{2}$	Eastern Counties	$4\frac{1}{4}$	—
$10\frac{1}{2}$	Croydon	$10\frac{1}{2}$	$11\frac{1}{2}$
$10\frac{1}{4}$	Dundee and Newtyle	2	—
10	Manchester and Bury	$5\frac{3}{4}$	6
10	Arbroath and Forfar	$1\frac{1}{4}$	—
10	Bolton and Leigh	$2\frac{3}{4}$	—
$8\frac{1}{4}$	Edinburgh and Dalkeith	$2\frac{1}{4}$	—
8	Ulster	—	$3\frac{3}{4}$
$6\frac{3}{4}$	Glasgow and Paisley	—	9
46	Brighton	—	5
5	Brandling Junction	$3\frac{1}{4}$	—
5	Manchester and Birmingham	—	$11\frac{1}{2}$
$3\frac{3}{4}$	London and Greenwich	38	40

The increase of traffic per cent., in August, 1840, as compared with August, 1839, has been as follows:—

South Western	120
Midland Counties	80
Newcastle and Carlisle	50
Birmingham	50
Birmingham and Derby	50
Eastern Counties	40
Manchester and Leeds	12
Great Western	11
Croydon	10
Grand Junction	8
Liverpool and Manchester	6
Greenwich	5

It must be further observed, that as the early part of August, 1840, is taken against the whole of August, 1839, the probability in the increase is, in fact, greater.—*Railway Magazine.*

Steam Travelling Extraordinary.—Leicester, Monday.—About half-past 12 o'clock this day, a train, the longest, perhaps, ever known, came along the Midland Counties Railway from Nottingham. It had four engines to drag it forward, and to the beholder appeared like a moving street, the houses of which were filled with human beings. The occasion of this extraordinary sight was a return visit made by the committee and friends of the Nottingham Mechanics' Exhibition to the Mechanics' Exhibition of this town. The number of carriages was 67, and the quantity of passengers nearly 3,000, most of whom were well and respectably attired. On the banks for a considerable distance, and also near to the station, tens of thousands of spectators had assembled to greet their arrival, and the scene altogether was one of the most imposing that can bo conceived. The Duke of Rutland's excellent band was in attendance, and played an appropriate air as the train entered tho company's premises, and afterwards preceded the cavalcade that was formed to proceed to the New Hall, where the exhibition has been for some weeks opened. About seven o'clock, the train set out on its return to Nottingham, when the crowd collected to witness their departure appeared quite as great as on their arrival.

Railway Compensation Cases.—Two cases of extravagant demands have lately been decided by a jury, in the Great Leinster and Munster Railway. Lord Portarlington demanded £1,200 for about 11 acres of land, for which the jury awarded only £365 12s. 6d. In another case, Mr. James Laparelle said he would most reluctantly accept £1,200 for $2\frac{1}{4}$ acres, which the jury thought worth only £200. Both these modest gentlemen had actually been offered moro by the company than the jury awarded.

The Pollock and Govan Railway was opened from Rutherglen to the Bromielaw harbour, on Saturday, the 22d ult., with a train of carriages containing the son of the spirited proprietor, William Dixon, Esq., of Govan-hill, and friends, the engineer and contractors upon the line, and also trains of coal wagons. The contemplated extension of this line of railway, with a terminus at Bromielaw harbour, to the Monkland, Wishaw, Coltness and Hamilton coal and iron-stone fields, will render it one of the most available means of opening up the richest district in Scotland.—*Glasgow Argus.*

Railways in Wales.—We understand that a railway is contemplated along the Vale of Glamorgan for the purpose of opening up a district abounding in coal and iron. The line has already been surveyed, and a highly favorable report received from the engineer, a gentleman of talent and experience. This affords another proof of the rapidly-increasing importance of the county of Glamorgan. Plans for another line, to be called the Swansea Vale Railway, have been deposited, and the project will probably come before Parliament next session. Mr. Bush is the engineer of the latter line.—*Railway Times.*

The Milan and Monza railroad was opened on the 17th inst., in the presence of the Viceroy of Lombardy, and his family, the cardinal archbishop, and all the civil and military authorities of Milan.

The Rotation Railway.—The late accidents upon railroads, which have in too many instances proved lamentably destructive of human life, demand the serious attention of those in the scientific world, upon whom devolves the task of providing a remedy themselves against similar catastrophes, or of examining the inventions of others, having that end in view. Although amidst the heap of new things which every day brings forth, there will, of necessity, be a vast quantity of rubbish, there may, on the other hand, be now and then a thought which at least merits a passing consideration. Of this nature appears to us to be the plan of locomotion proposed under the title of the "Rotation Railway," a model of which we have inspected at the Polytechnic Institution, Regent-street; the main advantages of which are stated to be economy and perfect safety, combined with great rapidity. Whether these *desiderata* would, or would not be secured, by the adoption of the proposed plan, we will not take upon ourselves to say; all we recommend is an examination of the invention by unprejudiced persons, who are, at the same time, perfectly competent to form a correct opinion. The plan is to propel carriages

upon the edges or peripheries of a double line of wheels, fixed upon the ground in the place of the rails at present in use. These wheels are to be turned by stationary steam-engine power, carrying along their upper surfaces the train of carriages, which are so constructed as to be overturned with difficulty, if at all. The wheels communicate with each other by means of straps, the object of which is to carry on rotary motion from one end of the line to the other. In a word, the wheels (which in this instance are nothing more than cylindrical rollers) are taken from the body of the carriage and fixed to the ground, propelling by their action any carriage placed upon their edges. The idea is both novel and ingenious, but a cursory examination of the model led us to suppose that a large amount of friction would have to be overcome. The inventor says "no," and we hope it may turn out to be so.—*Herald.*

GRATUITOUS COPIES

of our Journal have been forwarded to a number of Individuals interested in some Patent, or Invention, of which notice has been taken in our number of to-day.

TO INVENTORS.

ALL PERSONS who may be desirous of TAKING OUT PATENTS, or of bringing VALUABLE INVENTIONS into USE, are requested to APPLY to the PROPRIETORS of "THE INVENTORS' ADVOCATE," (DELIANSON CLARK & CO.) at their "PATENT AGENCY OFFICE FOR ALL COUNTRIES," 39, CHANCERY LANE, where they may be consulted, daily, relative to the PATENT LAWS of GREAT BRITAIN, and ALL OTHER STATES.—(See ADVERTISEMENT on the last page of the present Number.)

THE

INVENTORS' ADVOCATE,

AND

JOURNAL OF INDUSTRY.

SATURDAY, SEPT. 5, 1840.

We have again and again adverted to the indifference which our government shows to new inventions and discoveries in science—an indifference that is the more inexcusable as the maintenance of our manufacturing superiority, and with it the national welfare, depends in a great measure on the improvements continually making in the mechanical arts. We are glad to find that the subject has been at length taken up by the most powerful organ of public opinion in the country. The *Times*, however, confines its animadversions to one case alone, to which its attention has been directed, and that, too, one which, in our opinion, is of minor importance to innumerable instances that might be mentioned. We trust, however, since the notice of that journal has been directed to the indifference manifested by the government to an invention professing to be of great importance in the art of war, that it will pursue the subject in its more extended ramifications, and its bearings on the arts of peace.

With respect to the merits of the particular invention of a destructive weapon of war which the *Times* notices, we have no means of judging; but be it important or impracticable, the case may serve equally well as an illustration of the defective nature of the present system of administration as regards the encouragement of new inventions. Here is a discovery announced, backed too by the opinion of competent authorities, that professes to effect very important changes in the art of war, which might be entirely lost from the circumstance of our government not considering it any part of their duty to inquire into the merits of improvements in mechanical science,—still less to offer rewards as a stimulus to inventive genius.

With respect to those inventions which have for their object the improvement of weapons of war, there is, however, much less of negligence than in all inventions for the improvements of manufacturing machinery. The art of war has a direct bearing on the question of foreign politics; any invention relating to it, therefore, usually meets with more consideration than it is thought necessary to bestow on those inventions which relate only to our manufacturing industry.

It is a curious fact, indeed, that at the time our government is charged with neglecting an important invention in warfare, a similar charge is brought by some of the Foreign journals against the government of that country, and the example of England is, ignorantly enough, pointed out as worthy of imitation. A few weeks since, we translated an article from the *Moniteur Industriel* in which the adoption of modern inventions in the art of war by England, Russia, and Prussia, was mentioned in contrast with the indifference of France to those improvements. We have, in our present number, given from the *Fanal*, a Brussels paper, a description of an engine which it is said this country possesses for the destruction of the fleets of all other nations with which she may be at war. There is evidently a great deal of absurdity and exaggeration in this account, but we give it as a curious illustration of the false notions entertained by our neighbors of the watchfulness and activity of our government. The fact is,—the government never encourages one invention, be it for peace or war; nor does it adopt any until it is either forced on their notice by its well tried utility, or, what is still more prejudicial, unless it have the good fortune to be supported by some influential individuals. The effect of this wretched mode of management is, that the support which an invention meets with from the government comes either too late to be of use to the inventor, or it depends rather on political influence than on its intrinsic merit.

The Board of Trade, as at present constituted, is sadly deficient in attention to improvements in our manufactures. If a department were added to the board, superintended by competent scientific men, for the purpose of examining and reporting on all new inventions and useful scientific discoveries, with a view to their practical application to the arts and manufactures, and the reward of the inventors of really useful machinery or new manufacturing processes,—the effects of such an institution would soon be felt by giving an additional stimulus to inventive genius; and we have little doubt that it would be attended with incalculable advantages to the country.

RESISTANCE AS THE MEASURE OF MOVING POWER.

We endeavored, in a recent article, to explain the apparent incongruity in the relation between velocity and power. We showed that the space through which a body is propelled against the resistance of gravitation, is an erroneous measure of the quantity of its momentum; for, as the attraction of gravitation, like all other forces, exerts only a given power in a given time, the length of time which a body acts against that force, and not the space through which it is propelled, is the true measure of its moving power. We were, by this means, enabled to explain why a body that is propelled with only a double velocity rises four times as high. This effect, it was shown, is not to be attributed, as has been erroneously supposed, to a double velocity communicating quadruple power, but to the fact, that a body propelled with a double velocity, and gradually retarded by a double resistance, must necessarily move through

four times the space before its moving power is overcome. We wish now to prove, that the same principle applies to all yielding resisting forces, as well as to the force of gravitation, and that the momentum of a moving body is not to be measured by the depth it will penetrate into a yielding mass, but by the time required for that resistance to act before the body is brought to rest.

The nature of the resistance offered by a yielding substance, may be regarded as similar to that offered by a closed spring to the passage of any body forced through it. For instance, suppose a spring, which presents a resisting surface of one square inch, be made to act against a smooth bar of any metal passing through it with a force of ten pounds, this resisting force of ten pounds on the square inch would not vary with the velocity of the body moving through the spring, but would be a constant force. If one foot of the bar, or ten feet, were passed through the spring in a second, the total amount of resistance would in each case be the same; though in the former, the surface of one foot of the bar would experience the same resistance which in the latter case would be spread over the ten feet. In other words, when the bar was moving through the spring with ten times the velocity, the resistance on any one point would be diminished to one-tenth, though the total amount of resistance during a second would be the same in both cases; the *time* during which the action of the spring is exerted, being the measure of the amount of resistance which it offers. The spring would operate as an uniform retarding force to the passage of the bar, like the retarding force of gravitation to the ascent of rising bodies; and the effects of its action would be similar; for it would be found, if the velocity with which the bar was propelled through the spring were doubled, that four times the length of it would pass through, before its motion was overpowered by the resistance of the spring.

If we apply the same principle to the resistance offered by a yielding mass to the penetration of a ball propelled with different velocities, we perceive that the cause of a quadruple penetration by a double velocity is not owing to a quadruple increase of power, but to a diminished ratio of resistance in reference to the extent of penetration. The resisting force being constant, and not affected by the diminished or increased velocities of the bodies against which it acts, it follows, that in the case of solid yielding bodies, as in the case of gravitation, the effect of the retarding force must be comparatively less when the velocity is increased; as we explained in the article on Velocity and Power in the fifty-sixth number of our Journal. Some difference will arise when the resisting medium is compressible, and the velocity of the moving body is great; for in that case the resisting medium is compressed in front of the moving body, and presents an additional obstruction to its progress. So far as relates to the ordinary penetration of yielding substances, however, this principle will apply; that the momentum of a moving body is to be measured, not by the depth it will penetrate a yielding mass, but by the time its action continues against an uniformly retarding force. Had the philosophers of the last century attended to this fact, innumerable disputations would have been spared, and volumes upon volumes of specious sophistry would never have seen the light.

NEW INVENTIONS.

NEW APPARATUS FOR HANGING UP PICTURES.

We have just seen a very novel and useful invention for suspending pictures, on view at 17, King William Street, West Strand, and for which a patent has been taken out by Mr. W. Potts, of Birmingham.

The rail on which the suspending apparatus is hung, presents the appearance of an elegant moulding; the line of continuance being preserved. The means of fixing are not seen, nor do the hooks which slide in the groove of the rail touch the front, and they can pass without interruption from one end of the room to the other. The suspending apparatus affords the greatest facility for hanging or re-arranging a collection of pictures, when any addition is made to it, and as it entirely supersedes the use of nails or hooks being driven into the walls, as is very frequently done, it naturally preserves the decorations of rooms from damage by such means. It also includes a very ingenious method of inclining a painting to any angle, to suit the peculiar subject of it, which may be altered at pleasure. The whole is fixed up on the principle of strength, and is equally adapted for the gallery or sitting room. The inventor appears to us to have remedied all the defects which have so long been complained of in the mode hitherto adopted for hanging pictures.

NEW DISCOVERY IN NAVAL WARFARE.

We noticed, at much length, in our last, this new invention, which had formed a prominent feature in the *Times* newspaper. The Editor of that paper has since published an extract from the report of the gallant officer employed in making experiments with the new discovery. We give it insertion here:—

"In my opinion," writes this experienced officer to Lord Melbourne, "the merits of these inventions are so extraordinary as to vest the absolute sovereignty of the seas in the hands of the first power that shall adopt them; for I am fully convinced that it is impossible for anything that floats to resist them, either at close quarters or any given distance, even to a range of five and six miles. The strongest fortifications in Europe could not withstand these extraordinary powers for a single hour; in riverways and against stockades, as in India, the largest armies would be annihilated without a chance of escape, and the most difficult mountain passes would be utterly untenable against their operation. The country might by their application be rendered impregnable, for 100 sail of the line might be easily destroyed by a single small ship constructed on the principles I have had explained to me; and wherever it might be necessary to call this power into action, its effects would be attained at a trifling expense, and upon the shortest notice." In another part of this important report the gallant writer remarks—"I consider the whole country deeply indebted to ——— for these inventions, and deep gratitude is due to him for the patience, forbearance, and self-denial he has shown, when with so mighty a secret in his bosom his own interests would have been established in any other land by its disclosure. I therefore earnestly entreat your Lordship not longer to neglect a man upon whom the existence of the country may be truly said to depend."

We have commented on this subject, elsewhere.

ALARM GUN.

A very humane invention has just been very generally adopted, as a substitute for the old-fashioned gun. It is called "Nayler's patent alarm gun," and is particularly useful for the protection of game. It is easily set, and produces six loud reports, at intervals of a quarter of a minute, so as to wake the most careless watcher, and at the same time to point to the scene of plunder. It is also well adapted for the defence of buildings.

HOT AIR ENGINE.

The French Academy of Sciences has had submitted to it, a new application of hot air, as a moving power, intended to serve as a substitute for steam. The inventor is M. Franchot, who applies the elasticity of air to move machinery by its expansion by heat. The plan adopted by M. Franchot, he says, enables him to employ the latent heat of the gas, used as the moving power, more completely than in fire engines. The difference between the temperature of the gas before it enters the apparatus, and when it is expelled, is much greater on his plan, than in former engines of the kind. M. Franchot has not estimated the expense of the apparatus on a large scale, and the commissioners of the Academy will have to report upon that subject, as well as on the general merits of the invention.

NEW PROCESS OF PREPARING FLAX AND HEMP.

At a recent sitting of the Royal Academy of Sciences of Brussels, M. J. Scheidweiler, Professor of Botany at the Veterinary College, described a new and simple process for the fermentation of flax and hemp. It is generally known that, until flax and hemp have undergone the process of putrefactive fermentation, it is impossible to separate the filaments, so as to be enabled to spin them. The ordinary means of effecting this process is attended with much inconvenience and uncertainty, and it also occupies a long time. Mr. Scheidweiler turned his attention to the subject, and has found out a method of obtaining the required degree of putrefaction, in less time, without the great inconvenience and unhealthiness attending the other processes, and also without the risk of injuring the fibre which is often done by the common method. His apparatus consists of a wooden box, about six feet square, bored in the bottom with a hole, to which a hung is fitted. About five or six inches from the bottom there is placed a false bottom, pierced with holes, through which the products of fermentation run off. To effect the putrefaction in this simple apparatus, a bed of straw is spread equally on the false bottom, about three or four inches thick, upon which is placed the flax or hemp, as evenly as possible, and without leaving any interstices between the stalks, until the box is nearly

three quarters full. After having laid on the flax in this manner, it is covered with another layer of straw of about the same thickness as the first. The box is then filled with rain or river water, and it is covered over with a lid pierced with holes. The flax is left in this state from 24 to 48 hours, according to the temperature or the state of dryness of the stalks. The bung is then withdrawn, and after the water has run out, a workman treads the flax with wooden shoes. The flax treated in this manner soon begins to ferment. The most important point to be attended to, is to direct the fermentation so that the internal heat may never exceed from 30° to 36° of Reaumur (equivalent to 101° and 113° of Fahrenheit). The heat generated within the box rises gradually. During the first day it is about equal to that of the ambient atmosphere; the next it rises to 20° of Reaumur, and it continues to rise to 70°, and even higher if care be not taken to lower the temperature by the addition of cold water. This must be done every time the flax exhibits a tendency to rise above 36° of Reaumur. A heat of 40° and more, not only destroys the gummy substance in the stalks, but it materially deteriorates the quality of the threads. On the third day, several of the stalks must be taken from the heap to examine whether the gummy-resinous substance is sufficiently decomposed, and the threads begin to detach themselves from the woody part of the plant. When that is the case, it shows that the putrefactive process has been carried far enough, and the remains of the gummy substance must then be removed. This is done by spreading on the bed of straw that covers the flax, a layer of wood ashes, about four or five inches deep, on which small quantities of water are thrown at various times. The potash contained in the ashes completely dissolves the refuse of the gummy substance, without injuring the fibre of the flax. After throwing on the heap more pails-full of water, the flax is taken from the box, washed, and dried. Three preparations of hemp and flax by this method proved that the stalks can be sufficiently decomposed in four or five days at most, without any other trouble than that of observing the progress of the fermentation, and adding cold water to the fermenting mass from time to time as the heat increases beyond the requisite temperature.

SUBMARINE OPERATIONS AT SPITHEAD.

(From the *Hampshire Telegraph.*)

Thanks to Colonel Pasley, and his divers, and to the no less energetic, though humbler, exertions of Mr. Dean, we are becoming every day better acquainted with the bottom of Spithead, with the surface of which we have long been so familiar. The extent and importance, however, of these operations must not be measured, as they too often are, by the quantity and intrinsic value of the material brought up—and those persons who at times canvass rather freely the proceedings at Spithead, would do well to recollect the real objects in view, and to inquire how far those objects are in the way of being accomplished.

Mr. Dean and his party, who are working at the wreck of the Mary Rose, sunk in battle in the year 1545, in the reign of Henry VIII., have for their object the recovery of brass guns and such valuable articles; and their purpose has been fully answered last week. A brass gun, between 11 and 12 feet long, of exquisite workmanship, and upwards of 5 inches in the bore, has been fished up—it bears an inscription which will be easily read when the gun is washed; even at present, the name of Henry VIII. can be made out—over the inscription is a beautiful full-blown rose, and those parts technically called the dolphins, consist of angels lying on their backs, in one of those ingenious attitudes assumed by the incomparable clown, Mr. Charlton, who is at present delighting the good folks of this town.

Alongside of this curious and perfect piece of ordnance, was found an iron gun of the very rudest description, made out of bars hooped round—and what is still more remarkable, a granite shot, rather larger than a 32-pounder. It is very strange to observe the extremes of the art thus lying side by side for more than three centuries.

The operations of the Royal George have been conducted of late with far greater spirit and effect than those persons will readily understand who judge only by the piles of timber, guns, masts, and so forth, which are brought to land. It is obvious, that, in proportion as the work of demolition and removal go on, so the mass of materials collected must diminish, just as a coal-pit, or any other mine, is gradually worked out. Accordingly, Lieut. Symonds and his party of divers, and the other hard workers at Spithead, find daily less and less to get hold of; and at length, having cleared away nearly the whole wreck, from stem to stern, which was lying above the mud, they are obliged to resort to fresh means of getting at the remainder.

It must always be borne in mind, that Colonel Pasley's sole object is to clear the roadstead so effectually, that ships may with safety anchor on the spot which, though in the best part of Spithead, has for more than half a century, been effectually "tabooed." To do this, not only must the materials above the mud be removed, but those which are buried in it. Now, in order to enable the divers to get at and sling the remaining fragments of the wreck, it is necessary to dislodge the superincumbent bank of sand and mud, which has accumulated over them. Gunpowder, great and small charges, has already accomplished a great deal in this way; but as it is found that the washing of the tide speedily fills up the craters formed by these explosions, another, and very ingenious device, has lately been adopted by Lieut. Symonds.

This consists of a huge rake, made of a strong spar, furnished with long and sharp teeth, and duly loaded so as to sink in the mud. This machine, or mud comb as it may be called, is drawn backwards and forwards along the bottom, by hawsers extending from one of the lumps to the other; and as it passes along, it harrows up and loosens the mud so effectually, that the tides wash it away. In this way the bank is already sensibly diminished in height, and numerous timbers, planks, and even guns, are again beginning to show themselves above the surface of the bottom, and thus to come within the reach of the divers. As the rake is drawn along the bottom, it is often arrested by portions of the wreck; but whenever this occurs, the rake is lifted off the ground by means of a rope worked in a large boat stationed directly over it. As soon as the rake is lifted over the obstacle, the hawser in the lump is hove in, and the machine, which is again dropped on the mud, travels along the bottom.

While these scraping or combing operations are going on at the Royal George, Lieut. Symonds and his divers have, by Colonel Pasley's directions, employed themselves also at the wreck of the Edgar, from whence several large guns, and many curious minor relics, have been brought up. Of these last, we have been favored with the sight of a very handsome glazed vessel, called, we believe, a pipkin, and the fragment of a saucer, which, though they have lain at the bottom nearly 150 years, are as perfect in color and in texture as the day they were submerged, when that unfortunate ship was blown up. The number of guns brought up from the Edgar, is five; two more are slung, which will, no doubt, be brought up this afternoon; and the divers, Hall and Fullagar, who are employed on the Edgar, have buoyed off four others—making 11 in all. The step of a capstan was brought up from the Royal George this morning, and a large beam slung, which slipped off before it was drawn up to the surface; it will probably be got up this afternoon.

We are in great hopes that, if the weather continues as fine as it now is, the perseverance and skill of Colonel Pasley and his most zealous coadjutors will be rewarded even this season, by the completion of their arduous task, and that we shall see Spithead finally cleared of all obstructions, and ready to receive any fleet which it may be to the true interest, and not the mere vain glory of the country, to bring once more into vigorous operation.

SCIENTIFIC MEMORANDA, AND NOTES ON ART.

Capt. K. H. Kater's New Astronomical Clock.—The great object aimed at by Captain Kater, in the construction of the escapement of a chronometer, is to communicate equal impulses to the pendulum, through some principle perfect in itself, and not dependent for its success on superior execution. In the escapement invented by him, the pendulum merely raises a weight, and is impelled by that weight through an increased space in its descent. It neither unlocks a detent, nor has anything to do with the train; and as the weight raised, and the spaces described, are constant quantities, this escapement is, in the strict meaning of the term, one of equal impulse.—*Proc. Roy. Soc. Lond.* 1840.

New Process for making Sulphuric Acid.—M. Provostaye, of Paris, has proposed the following process:—He recommends introducing into the leaden chamber, sulphuric acid, nitric acid, and the vapor of water. To understand what takes place under these circumstances, a current of sulphurous acid may be passed into a flask containing nitric acid: this should be made, by means of a bent tube, to communicate successively with a flask containing sulphuric acid, a globular vessel moistened with water, and a dry globe. The nitric acid is completely decomposed. The first flask contains pure sulphuric acid alone. Red vapors pass from the first vessel into the second; this is filled with sulphurous acid also, for it is formed of solid white crystals, in the two last experiments, as in the first. In the latter, all the sulphuric acid of the second flask exists in a solid crystallized mass, of a greenish yellow color. The reactions are, therefore, similar to those of the old process. In the new process, the nitric acid yields a portion of its oxygen to the sulphurous acid, in order to convert it into sulphuric acid. Hyponitric acid is thus formed, which acts like the hyponitric acid in the old process, which is formed from the binoxide of azote and oxygen of the atmosphere: that is to say, successively it yields oxygen to the sulphurous acid, and borrows it from the air; but the discharge requires the intervention of sulphuric acid and water. The water has two very distinct functions: it acts directly, by bringing into more intimate contact the sulphurous acid and hyponitric acid, and this favors the oxidation of the first by the oxygen of the second; it acts also by decomposing the white crystals immediately, and changing them into sulphuric acid and oxide of azote.

Gannal's Process for Embalming.—2 68 lbs. troy of dry sulphate of alumina are dissolved in .88 (or rather more than ¾ of a pint of hot water). Five or six pints of a solution made after these proportions, are to be injected into all the vessels of the body to be embalmed. To prevent the attack of insects, it is proper to add 15.43 grs. of chloride of copper to every 2.68 lbs. troy of sulphate of alumina, or 771½ grs. of arsenic.

Elaterite, or Fossil Caoutchouc.—Pelouze has ascertained that this substance, which occurs in La Vendée, has the same composition as Indian rubber, viz., C8H17. In this country it is accompanied by a sort of gum resin, which is sometimes red, sometimes yellow, and even greenish; transparent, insoluble in water, and corresponds in its characters with amber.

Artificial Preparation of Sugar.—1. Sugar similar to that of grapes, may be prepared by boiling one part of the starch of potatoes or flour, with from 1-100 to 1-10 of sulphuric acid, and four parts of water, for 36 or 40 hours, care being taken to renew the water as it evaporates. At a higher pressure and temperature, the change may be effected more rapidly with a smaller quantity of acid. The excess of acid is then to be saturated with lime, the sulphate of lime separated, and the liquid concentrated by sufficient evaporation. 2. The starch of flour soon loses its gelatinous consistence, when moistened with an extract of sprouted barley; it is transformed into a liquid, and if the barley is in sufficient quantity it is changed in the course of a few hours into sugar of grapes, provided the temperature be maintained at 158 deg. to 167 deg. Six parts of barley which has germinated, produce 25 parts of sugar of grapes. 3. Grape sugar may also be prepared from wood sawings; it may also be procured by taking 12 parts of linen rags, or paper cut into small pieces, mixing them intimately and gradually with 17 parts of concentrated sulphuric acid, or with five parts of sulphuric acid, and one part of water; the temperature must be kept moderate. After 24 hours, the mass is to be dissolved in a quantity of water, and boiled for ten hours; it is then to be neutralized with chalk, filtered and evaporated to the consistence of syrup, and crystallized. Chemists have not yet been able to obtain sugar prepared by these artificial methods in regular crystals like cane sugar, although there is little doubt that these two species differ from each other merely in the quantity of water with which they are combined.

Sweeping of Chimneys done away with.—The fact cannot be too generally known, that if when a chimney is built, the mortar with which it is to be plastered be mixed with salt, there will be no necessity for sweeping it, as in every damp spell of weather the salt deliquesces, and the soot will of course fall down. A chimney which was treated in

the above manner 20 years ago, has been in use every winter since. Part of the time, a fireplace was used with a grate and bituminous coal, but now with a stove and wood. The stove-pipe frequently catches fire, which is suffered to burn in the chimney, without apprehension of danger.—*Birmingham Advertiser.*

VARIETIES.

The Second Meeting of the Association of Italian Philosophers for the Advancement of Science will commence at Turin, on 15th September, and terminate on the 30th. It will be recollected that the first meeting was held last year at Pisa, under the patronage of the Grand Duke, when Prince Lucien Bonaparte was president.

Duty on French Oak.—We learn from the *Journal de Granville* that the French Government have laid a duty of 10d. per cubic foot on French oak exported from that country for the purpose of ship-building, which amounts to an absolute prohibition, and will be highly prejudicial to the shipwrights of this island.—*Jersey Paper.*

A Salt Mine has been discovered at Rheinfelden, in the canton of Argau, which the Swiss papers expect will be sufficiently abundant to supply all Switzerland, and thus save to the Confederation the 500,000f. annually drawn from it for the purchase of foreign salt.—*Galignani's Messenger.*

A New Rat-Trap.—A correspondent has sent us the following account of a newly-invented rat-trap, which has already been used with marked success. Take a barrel, and stretch a skin of parchment over it with a string; cut it across and athwart, nearly to the outside. Take some dripping, and mix it with meal; smear it on the middle of the parchment. The rats will smell it, and treading on the parchment it will give way, and they will fall into the water into the barrel. Put a plank for them to creep up to the barrel's brink, outside, and strew some oatmeal on it. You must not let the water be too deep, but set a brick endways in it, and the first rat that is caught will make a noise, which will entice more, so that they will fight for possession of the brick, and the noise will draw others. Thus, in one night, the house may be cleared of rats, be they never so many. Mice and other vermin may be caught in a similar manner.

The London Mail.—The first mail from the south brought by the railway, arrived here a few minutes before 9 o'clock on Monday morning. Hull may now be fairly considered as only 12 hours from the metropolis, and by 10 o'clock in the morning we can read an account of what was doing there up to six the preceding evening.—*Hull Rockingham.*

The Polytechnic Institution.—This useful exhibition has lately been making such rapid strides in public favor, that the directors have thought necessary to order a material increase in the length of the gallery, with the addition of a handsome balcony at each end. Rooms are also in progress of building for the proper exhibition of the wonders of optics, and other branches of philosophical science. The whole of these alterations, which comprehend the addition of nearly 5,000 superficial feet to the already extensive premises, will be completed before Christmas.

The Clerks of the Metropolis.—We are happy to find that a society, to be called "The Provident Clerks' Mutual Benefit Association and Benevolent Society," is in course of establishment. It purposes, to "ensure an allowance in sickness, an annuity in old age, a sum of money at death, &c.;" with also "a fund to be raised by voluntary contributions for the purpose of affording relief to clerks of good character in distress, who have not been able, either from affliction or other unavoidable circumstances, to secure for themselves the advantages arising from the benefit department." We have much mistaken the character of the merchants of London, if this infant association meet not with their readiest and most efficient assistance.

Sir Francis Chantrey.—In giving evidence, recently, in the case of Carew v. the Executors of the Earl of Egremont, this eminent sculptor stated some facts relative to his own personal history, which cannot fail to interest and encourage artists who practise so honorable but hazardous a branch of the profession. He said his age was either 54 or 56; he came to London in 1802, and began to labor at sculpture; he never worked for any other sculptor, and never had an hour's instruction from any sculptor in his life; he established a studio as soon as he could afford it—that was eight years after he entered the metropolis—and during those years he never made £5 in his profession. The bust by which he first got his reputation, he made for nothing—it was a bust of Horne Tooke; it went to the exhibition in model, for neither Horne Tooke nor he could afford to make it in marble; he got £12,000 of commissions by that bust at the exhibition; "so that," adds the admirable artist and high-minded gentleman, "you see how uncertain the rise of a sculptor is."

New Species of Kangaroo.—Mr. Gould, who has just returned from Australia, has discovered, and described before the London Zoological Society, six new species of kangaroo, inhabiting the interior of that country. Some of them are of a very remarkable formation, and the entire number form very interesting additions to the specimens of that most curious animal, previously known to the zoological student.

The Penny Postage.—Within the last few days, all labelled letters passing through the Post-Office have been stamped in black ink instead of red—a change which has been brought about in consequence of a communication lately received by the Government from a scientific chemist (who declines giving his name), in which he explains the method of preparing a composition which will entirely annihilate the red stamp, reducing the label to its original appearance: but it only possesses this power over the red ink,—the coloring matter of the black ink being of such a nature as to resist the action of this compound. In future, the black will be substituted for the red.—*Ministerial Paper.*

Departure of the British Queen Steam-ship for New York.—Precisely at two o'clock on Sunday afternoon the British and Transatlantic Steam Navigation Company's powerful steam-ship, British Queen, Lieut. Roberts, R.N., commander, sailed from her moorings off the Brunswick Steam-packet wharf, Blackwall, for New York. A report had been circulated to the effect that as the British Queen was still under seizure, in consequence of the late smuggling transactions on board, she would not be permitted to sail for New York until the Commissioners of Customs had adjudicated upon the case; but this proves to be erroneous, the company having, it is rumored, previously satisfied the board that they would hold themselves responsible, whatever may be the final decision of the commissioners in the case. Accordingly, at two o'clock the signal gun for starting was fired from her larboard side, and in less than two minutes the British Queen, with her poop crowded with passengers, was to be seen proceeding in majestic style, against a strong flood tide, down the river. She takes out about 150 passengers, among whom are several French ladies and gentlemen. She has also on board a valuable cargo of light goods. Her ship letter-bag from the General Post Office contains several thousand letters, besides an immense number of newspapers. The British Queen has been fresh manned, the old crew, supposed to be more or less implicated in the late smuggling affair, having, with the exception of the first engineer and two or three others, been discharged the company's service.

The British Queen.—The following is posted at the North and South American Coffee-house:—"Southampton, Sept. 1.—In consequence of the up-train running off the rails and ploughing into the sand at Weybridge, the down-train was unable to pass, and was detained an hour and a half. This made it late before we reached Southampton, and it was half-past five o'clock when the steam-boat of the British Queen received her passengers. Precisely at seven o'clock, the ship was under weigh for New York, having on board 100 cabin passengers, 950 packages of fine goods, and £20,000 in specie. The evening is singularly delightful, and the young moon held out the half-illuminated lamp to light the Queen through the Needles. The ship is in fine order, and promises to make a speedy passage, an object most desirable, considering the number of passengers and great value of the cargo, the largest ever taken out in a steam-ship, excepting that by the President."

Arrival of the "Great Western."—Bristol, Sept. 1, 2 o'clock, A M.—The Great Western arrived at her moorings in Kingroad at 10 minutes past 12 last night, having left New York on the evening of the 18th of August, thus completing her voyage in 13¼ days. Her voyage to New York occupied 14½ days. She brings with her 70 passengers.

Departure of the Oriental for Alexandria, with the first of the Accelerated East India Mails.—Southampton, Sept. 1.—The Oriental started from this place to-day, and will call at Falmouth to take on board the mails; she got under weigh exactly at half-past 10, and was saluted from the battery at the east end of the town, and cheered by a vast concourse of spectators. She returned the salute as she proceeded. She carries out about 60 cabin passengers, a detachment of the 77th Regiment, a company of Royal Artillery, and a considerable amount of specie, and makes about £3,000 freight and passage money, exclusive of the sum paid by Government for the mail service, which it is said is £38,000 per annum. The contract with the Oriental Company for this service (which has been printed) is for a term of six years certain, and to continue further until either of the contracting parties gives the other twelve months' notice to discontinue it.

Steam Navigation in Australia.—The steam-ship "Sea-Horse," of 250-horse power, sailed from Gravesend on Thursday morning, for Sydney. We understand that this vessel is intended to ply between the various ports in the Australian Colonies, for which purpose, from her build and great power, she is eminently qualified, it having been proved that the small steam-vessels which have hitherto been sent ont, were unable to contend with the heavy seas of those southern latitudes.

The New Ship of the Line, the "London."—The Lords Commissioners of the Admiralty have directed that the London of 92 guns, shall be launched on Monday, the 28th inst.; and, as the tide will flow until 3 o'clock that day, the launch is not expected to take place much before 2. Her stern, which was originally constructed after a plan of the late Sir R. Seppings, has been removed, and replaced by one designed by Mr. Fincham, the present master shipwright of the Chatham yard, and has a noble yet light and elegant appearance. The port illuminators, or birds'-eyes, hitherto fitted in the scuttle of the lower deck of ships of this class, have in this instance been inserted in holes made for them in the ship's side, between the ports, and they are so fitted that by a winch being applied to a nut on the screw, at the inner end of the plug, which contains the bull's-eye, the whole may be drawn in or forced out at pleasure, so as to admit the air fore and aft the lower deck, without hauling up the ports in rough weather. The bull's-eye being placed in this position, the light falls from it directly on the people in the berth, without loss or impediment; whereas, when it was fitted in the scuttle of the lower deck port, the greater part of it was lost by the intervention of the gun, which, as a matter of course, was placed before it. This great improvement, so conducive to the health, comfort, and good spirits of the crew, for darkness and sulkiness generally dwell together, is said to be the invention of Mr. Lang, the master shipwright of Woolwich Dockyard. The London is also to be fitted with one of Captain Lihon's patent rudders, which is now ready for hanging.

Despatch at Sheerness Dockyard.—An order for preparing the Howe, first rate, 120 guns, for sea, arrived on Thursday last. She was accordingly taken into the basin at half-past 12 o'clock, thence into one of the dry docks, with all her masts, guns, stores, and everything on board. The water was pumped out by the steam engines, she was blocked up, her bottom examined, and her copper repaired where necessary, and she was ready to go to sea the same evening. The following day (Friday) she was taken out of dock. Thus the whole process of docking, undocking, cleansing, and examining the bottom, and repairing the copper of a first rate, of 120 guns, with all standing, was completed in the short space of 24 hours, and, had it been necessary, it might have been completed even in less time.

The "Dugdale Society."—Under the title of "The Dugdale Society," another association is forming in the metropolis, for the elucidation of British Family antiquity, by the publication of inedited documents, and by systematic reference to those already extant. By the collection and arrangement of the abundant materials which lie dispersed about the country, in public and private receptacles, it is the purpose of the society to establish a body of authentic records, which, independently of their value in aid of investigations into matters of descent and title, may help the solution of many an inquiry interesting to the historian or antiquary. The means by which the society proposes to effect its objects are, the examination and classification of ancient documents relating to family antiquities—notices of the Leiger books of monasteries, priories, and other foundations, with extracts therefrom—transcripts of foundation charters—of heraldic visitations—historical particulars of parish registers—collections from ancient monumental brasses, epitaphs, and armorial ensigns—excerpts from the Harleian, Cottonian, and other MSS. in the British Museum, the Bodleian and various private libraries—extracts from the old historiographers, &c.

The New Manure.—Nitrate of Soda.—This has been advantageously applied to produce a most luxuriant and abundant aftermath. It was applied after the hay crop was gathered, in quantity about as much as if you were sowing oats; in ten days, a large green mass of vegetation had sprung up four inches high, producing a far greater mass of vegetation than the same field produced in the spring of the year, although the meadow had received a good coating of stalk dung and soil. The application of the nitrate of soda now spoken of, took place in the recent hot weather, and never had a shower of rain upon it during the ten days—every morning there appeared to be a heavy dew upon this part of the meadow, when on the other parts none was apparent. The appearance of this part of the land, has a great contrast with the other aftermath, the grass of which is universally low, wiry, and spindling. It might be concluded, had the hay harvest been earlier, a second crop might have been obtained better than the first; it is certain that this aftermath is far superior to the first crop. The grass ominously called squitch grass, is scarcely apparent in it; whilst the rib grass and other herbaceous grasses are most abundant, and very luxuriant. The nitrate of soda is very apt to absorb moisture from the atmosphere. Agriculturists would do well, in purchasing it, to see that they have it well dried, otherwise they would pay a large proportion for water; it should be purchased by a broker from the importer, of a certain refraction, as great gain will be thus insured in obtaining the article. There can be no question, that in producing hay crops it would prove the most advantageous manure that can be applied; and without impoverishing the ground, two crops of hay may be annually obtained. This experiment was made upon a very ordinary meadow, and upon the worst part of it; under all the plans of cultivation to which the meadow has been subjected, none has ever succeeded so well, either in quantity or quality of the grass. The experiment may be easily tried at the present time of the year, by any agriculturist—any grass plot gives an opportunity for the like purpose. From examples so simply tried, proof sufficient may be made to cause the nitrate of soda to become universally used, for the purpose of a cheap and highly productive manure.—*From a Correspondent.*

Lectures on the Art of Writing, by J. Carstairs. Sixth Edition.—The system of writing, as taught by Mr. Carstairs, is, we believe, very generally known. The plan adopted is peculiarly his own, and by a course of long experience he is enabled to perfect his scholars in a surprisingly short space of time. His book is a complete curiosity,—not only illustrating the practical method of writing well, but comprehending a variety of acute observations on the impediments which retard the progress of the learner; including a brief and interesting history of the art, and the materials used from the earliest ages to the present time. The "examples" for the use of students, are copious and lucid, and we have little doubt that a person bent on improvement would find this book a valuable aid to him in the prosecution of his studies.

The Chemist, No. 9.—This useful periodical is the avowed reporter of chemical discoveries and improvements, and the protector of the rights of the chemist, and chemical manufacturer. It is a very varied and instructive Miscellany, from which we purpose making several extracts at an early opportunity.

"*The Servant Girl in London.*"—This little manual is intended, its author observes, to show the dangers to which young country girls are exposed on their arrival in town. If what he states be true, the said servant girls had better remain in the country; for he draws such a picture of London and its diabolical practices, as it would drive an ignorant lass half mad to contemplate. We live in London, and are perhaps used to such things; yet we cannot believe that a moiety of what is herein set forth can be true. If it be, we again repeat,—let country girls remain where they are, and seek their fortunes any where but in Town.

OBITUARY.

PROFESSOR MULLER, OF GOTTINGEN.

The following is an extract of a letter from Mr. G. Finlay to Lieut. Colonel Locke, dated Athens, August 8:—

"The subject on which I proposed writing, was the melancholy death of Professor Muller, of Gottingen. He died here on Saturday, (1st inst.), in the afternoon. He was taken ill some days before, at Delphi, where he exposed himself very much to the sun, copying inscriptions for hours together, during the heat of the day. He had made an excavation along the polygonal wall, which supported the basement of the great temple, by which he had discovered a number of new and long inscriptions. He likewise discovered some subterraneous chambers under the site of the temple, but he was unable to extend his excavation, as they were under the houses of the peasants. When his illness was known here, one of the royal carriages and the King's physician were sent to meet him at Kaya a khan, below Gyphtokastran (Oenoe), and he was conveyed here on Friday last, but in a state which rendered his recovery hopeless.

"M. Curtius, who accompanied him, with Dr. Schoell, of Berlin, tells me that the foundation of his illness was laid by his over exerting himself at Athens, in copying the modern plan of Athens by the architects. I however spent a night with him and his party at Rhamnus, where we slept in the open air, and parted from him next day at Grammatiko, when he appeared in perfect health and high spirits. The foundation of the mortal disease seems to have been laid either at Orchomenos, where he slept out in a region of malaria, or by his great exertions at Delphi. As nobody can appreciate the loss the literary world has sustained, so well as you, I shall not say a word on that subject; but I cannot recollect his amiable personal qualities, and the care with which he made his profound learning available in social intercourse, without deep regret. On his return I expected him to pay Liosea a visit, and to examine the topographia of D'Acria: he is now buried on the summit of the little hill above the Academy. This was the idea of the Council of the Athenian University. He had intended, on his return to Germany, commencing his great work on the general history of Greece, which was to have been preceded by a topographical description of the country by M. Curtius, for which Muller would have constructed the maps and given his aid. He had already made many curious discoveries and observations, which it is to be hoped will be given by Dr. Schoell or Curtius in an account of their journey.

REPORTS OF SCIENTIFIC MEETINGS.

ROYAL SOCIETY.

ANNIVERSARY MEETING.

(Extract from the President's Address.)

In compliance with the request conveyed to us by the First Lord of the Admiralty, the council transmitted to the government a body of hints and instructions in different branches of science, which I trust are likely to be of material use both to the principal and to the subsidiary objects of the Antarctic expedition. These hints and instructions would have been far less extensive and efficient if the council had not been able to have recourse to the several scientific committees, of whose formation the society is already aware. The expedition has now sailed, amply provided with the best scientific instruments, and furnished with ample scientific instructions; it is commanded by one well acquainted both with magnetic inquiry and nautical research. We may, therefore, hope that with the blessings of Providence, it will return with a store of knowledge valuable to the geographer, to the geologist, to the meteorologist, and to him also who studies the marvels of vegetable and animal life. In addition to all this we may hope that the main object of the expedition will be accomplished, by additional light thrown on the obscure problems which still attend the magnetism of the earth; and that by such discoveries Captain James Clark Ross may not only add to his own reputation and his country's glory, but also give to the adventurous mariner increased facility and security in traversing the pathways of the ocean.

The Antarctic expedition was not the only measure recommended by the Royal Society and the British Association to Her Majesty's government. Another important recommendation, which had previously been brought forward by Baron Humboldt, was the establishment of fixed magnetic observatories, for the purpose of making simultaneous observations in different parts of our colonial possessions. These recommendations have been readily acceded to, both by the government, and by the Court of Directors of the East India Company; and probably ere many months shall have elapsed, the observatories will be in full activity. This ready acquiescence in the wishes of men of science appears to me highly creditable to our statesmen; and I feel confident, that while science belongs to no party, on the other hand, every party in this country is fully aware of the importance of science, and of the numerous benefits conferred by it on the human race.

I have stated, gentlemen, that your council had recourse to the scientific committees for assistance in drawing up instructions for the expedition in different branches of knowledge; those committees, who were named only two years ago, were at first apparently more a matter of form than substance; they have now been found capable of doing excellent service. Not only has your council consulted them on the questions already alluded to, but also observing that the several committees are composed of the most competent judges of the merits of the memoirs in the respective departments of science communicated to the society, they have in general referred the papers to them to report upon, previously to coming to a decision regarding their publication.

The Royal Society, from its character of pursuing every branch of physical science, is evidently in a different position from other societies, professing some one science alone. It may be reasonably expected, that in the Botanical or Geological Society, for instance, the whole council should possess a certain degree of botanical or geological knowledge. This, however, cannot be the case with us. Our council will comprise a few astronomers, a few geologists, a few botanists, and a few persons well acquainted with geology and medicine; but no single science can monopolise a large number of its members. In difficult questions we have, therefore, felt that it is more satisfactory to ourselves, and we think probably more so to the general body of the society, and to those who have favored us with papers, that we should ask the opinion of a larger number of men conversant with the immediate sciences in question. At the same time, the council retains its responsibility for its acts, and the chief officers of the society are officially members of each of the scientific committees.

The council have derived a further assistance from these committees in the adjudication of our medals. In naming these committees, the council has had both a difficult and a delicate task. Convinced that bodies when too numerous are little adapted for business, they have also felt that the power of giving their attendance might be more important than absolute superiority of scientific attainments. Some members have, however, been selected, though really non-resident, because it was believed that their colleagues might wish to consult them by letter. With these objects and views the council have done their best; but they have little doubt that some gentlemen have been overlooked and omitted whose presence in the committees might have been very desirable. The society must consider this in some degree a new system, to be perfected and improved by experience alone.

Another question has occupied a share of the time of the council during the last year. We have felt that the testimonial of recommendation for new fellows has scarcely been sufficiently definite and precise in stating the grounds on which the candidate was recommended to the body of the society. We have, therefore, thought it desirable to draw up forms of testimonials, some one of which may be adopted as most fit for each individual so recommended. We have thought this more fair, at the same time, to the meritorious candidate, and to those electors who are otherwise left in the dark with respect to his claims for their suffrages. We hope and trust that this new regulation will not stand in the way of any candidate who would be a desirable addition to our number.

BOTANICAL SOCIETY OF LONDON

As the time is drawing near for the execution of one of the principal objects for which this society was established—viz, the exchange and distribution of dried British and Foreign plants to the members (in proportion to the number and value of the specimens forwarded to the society's collection), the council have issued the following notice to members:—

In conformity with a notice forwarded on the 23d of May last, the council have thought it advisable to issue the following directions to members and others contributing specimens of plants to the Herbarium, and for the next distribution of the duplicates; the object being to lessen to a considerable extent the labors of the honorary curator, and those gentlemen who kindly volunteer their assistance to effect the undertaking.

1. It is particularly requested that each member contributing specimens, will apply to the secretary for *additional labels*, provided sufficient have not been forwarded.

2. Members who may desire to contribute to the society's Herbarium of British plants, are requested to bear in recollection, that the specimens are intended to illustrate the geographical distribution of the species; an object that will be greatly promoted by any member transmitting specimens of the less common species, from different counties, or from parishes not adjacent to each other. Of even the commonest species, it is highly desirable for the society to receive specimens gathered near the summits of the loftier hills, or in counties situate near the northern or southern extremities of Britain.

3. It is also further requested, that members contributing specimens, will as far as is practicable, *label every individual specimen*, thus diminishing to an incredible degree the manual labors of the curator.

4. If the name of any species should not be known to the member who sends the specimens, it will be sufficient to fill up the label correctly in other particulars, and leave a blank for the name, which will be inserted by the curator.

5. It is likewise expected that each contributor will furnish *a list of the species* he forwards, with the number of specimens prefixed to the same, together with his list of desiderata, marked if possible on the catalogue of British plants published by the Botanical Society of Edinburgh.

6. All parcels of plants intended for the next annual distribution, are requested to be forwarded to the secretary, free of expense, on or before the 1st of October next, addressed to No. 20, Bedford-street, Covent-garden, the Society's rooms.

By order of the Council,
G. E. DENNES, *Hon. Sec.*

*** Specimens if badly preserved, will be rejected.

ON POLAR OSCILLATION.

Communicated by J. Utting, Esq., of Lynn Regis, Norfolk.

We are informed by Laplace, that the period of oscillation of the obliquity includes millions of years; but the difference between the greatest and least obliquity cannot exceed 2 deg. 42 min.; this effect is produced by the action of Jupiter and *Venus*, on the protuberance of the earth at the equator, but principally by the latter.

Now, supposing the mean obliquity to be 24 deg., the least obliquity will be 22 deg. 39 min., and the greatest 25 deg. 21 min.; in the two latter cases the obliquity will present no visible change for a considerable period of time, probably for some centuries; but in passing from either of the above points, the diminution or increase, although very slow at first, will be *accelerated* till the obliquity arrives at its mean state, or to 24 deg. at when the secular motion, be a maximum; after which a *retardation* of the secular motion will take place till the obliquity attains its opposite limit, and *vice versa*.

The motion of the obliquity varies similarly to the lengths of our days, when the sun enters the equinoxial and solstitial points, &c.; increasing slowly at first from December, when the days are shortest, till March when the difference arrives at its maximum, after which the difference decreases from March till June, when the day attains its greatest length. Now the length of the day at the summer and winter solstices, continues nearly the same for about ten or twelve days together; whereas at the equinoxes there is a difference in the length of the days of about 45 minutes in the same space of time. At the solstices. when the lengths of the days have attained their *maximum*, or *minimum* value, they change from an increase to a decrease, and *vice versa*, similar to the obliquity.

The theory of polar transition, advocated by Mr. Saull, seems to be untenable; as the most accurate observations have not to the present time detected the least variation in the latitudes of places on the earth's surface: besides, the spheroidal figure of the earth and planets discountenance it altogether.

The *nutation* of the earth's axis is found to be something less than 20 seconds, and had there been any motion of transition, it must have been discovered likewise, without a *shadow* of a doubt.

THE THEATRES.

"See that the players be well used."—*Hamlet.*
"Nothing extenuate, nor aught set down in malice." *Othello.*

The note of preparation for the winter campaign at the National theatres, has been sounded full early, and *we* should say much *too* early,—as all who have the means, have long since fled to the sea-side, to renew their energies for a trying winter. It is not likely, while the weather remains so enchantingly fine, that they will be in a hurry to return to the smoke of London.

COVENT GARDEN.—Madame VESTRIS has put forth a list of her "Company," and announced the reopening of this theatre on Monday next. The pieces selected for the occasion, are—The *Merry Wives of Windsor*, and The *Sleeping Beauty in the Wood;* cast precisely the same as they were last season.

The nightly expenses have been curtailed, we hear, so as to average £160 per night instead of £200, as hitherto. This is a wise step, and we see no loss to the public in the arrangement, for we miss the names of no actor of any note.

The "Company" is very nearly the same as last season,—FARREN remaining, as before, the manager's trump-card. Miss Ellen TREE, too, ranks first among the ladies; she is indeed the richest jewel in Madame's diadem. Mrs. NISBETT and Miss RAINFORTH follow next in rank, and these three ladies are alone a host. We say nothing of *Madame* herself, and her better-half, for they are, of course, the "stars" of the establishment. It would be premature in us to offer an opinion, at the present moment, on the prospects of the season. We must first watch the progress of events, and then, as honest journalists, we will speak our mind. By the way, we were not fairly used by this establishment last season. We found it necessary, on one or two occasions, to "put on our Bishop's wig," and write an *impartial* critique on the "casting" of several characters in certain plays, and for this, *we were denied admission at the doors.* Of course, we most readily returned our tickets of admission; considering it our duty towards the public to be unfettered in our judgment: and so the matter rested till the end of the season. We now leave it to the management to act as they consider right in their wisdom. We bear no malice whatever towards them; on the contrary, we wish them every success. If they withhold from us—what ought to be the right of every independent journalist—free access to their theatre, we cannot, we think, err in our judgment, if we lay the "unkindly feeling" at *their* door.

DRURY LANE.—It is stated in dramatic circles that Mr. ELIASON, having failed in his endeavors to form an English operatic company for the approaching season, has set off for Germany, to engage foreign performers; and he has also despatched an agent to Paris to engage a *corps de ballet*, The terms which he offered to the leading English vocalists were not accepted.

HAYMARKET.—WEBSTER is carrying on the war with increased spirit, and, we are happy to say, with a result every way beneficial to his treasury. WALLACK appeared, for the first time since his return to England from America, on Monday. He made his bow in *Don Felix*, the hero of Mrs. Centlivre's admirable comedy of the *Wonder*. He has always been a favorite actor of our's, and on this occasion he increased our admiration of his talent. With Charles KEMBLE in our mind's eye, we saw him with a degree of prejudice, if we may so speak. Nevertheless, this was speedily removed; and we may honestly say he acquitted himself nobly. In deportment, he was easy and gentlemanly; and his idea of the character was as correct, as his development of it was happy. We could have wished to have seen him better provided with a *Donna Violante*. Miss FAUCIT's affectation, and stilted mannerism, prevented the play from being nearly as effective and natural as it might, and *ought* to have been. This should be rectified instantly, as there are several very talented actresses in the establishment.

Mrs. STIRLING made her first appearance here on the same evening, as *Angeline*. Her fascinating manners, and finished performance, called down tumults of applause. Her engagement will prove a fortunate speculation for the manager; but she must have something *worthy* of her abilities provided for her, forthwith.

NEW STRAND.—A new company of actors has been engaged here. We may particularise Tom LEE and MANDERS, as being *par excellence* the "pet boys" of the public. The first is richly "tinted" with the brogue, and the latter overflows with genuine comic humor. A visit here, will be amply repaid.

ASTLEY'S is doing a tremendous business with *Mazeppa*, the *Siege of Troy*, and DUCROW'S noble Stud; the VICTORIA opens on Monday, for the winter season, with an efficient company; and SADLER'S WELLS is producing novelties in rapid succession. At the OLYMPIC, Mr. BUTLER is most industriously engaged in preparing for the opening. The house will be splendid, and the "company" will be highly efficient. We shall enumerate their names at the proper season.

PUBLIC COMPANIES.

THE FIRE PREVENTIVE COMPANY.

The recent disastrous fires in the metropolis, disastrous not only as connected with the loss of property but also the destruction of human life, naturally attract the attention of every lover of humanity to discover the best means to provide a remedy against the repetition of such calamities. A society has been formed, relying not on its pretensions, but on its actual experiments, exhibited before and recognised by the public, under the title of the Fire Preventive Company. An experiment on the most extensive scale was tried some time since, under the direction of Mr. Shepherd, the surveyor of the company at Manchester, and in the autumn of the year 1838 the experiment was repeated upon premises in the Clapham-road, to the perfect satisfaction of numerous spectators. The attention of the government has been so far attracted to this subject, that after experiments performed at the works of the company, Upper Ground street, Blackfriars, in the prosence of Colonel Fanshawe, Captain Jebb, Royal Engineers, and of Mr. Ewart, principal engineer at Woolwich, the Lords of the Admiralty have directed that the engine-rooms of the steam frigates, Medea and Lucifer, shall be fitted up on the principle of this company. On Tuesday evening, an experiment was made at the works of the company,'exposing a tripartite flooring to the heat of the furnace of a brick-kiln. The first of the divisions was composed of a ceiling worked with two coats, and set with the fireproof cement, leaving the laths naked; the second with the laths protected by the cement, but not spread out; the third with two coats of the cement, and set with common plaster. The first division was, to use a technical term amongst builders, 'jugged' as usual, and coated with the preventive cement. Upon this, in the ordinary structure of a dwelling-house, the flooring would be placed. Upon a rude structure with all the disadvantages of draughts and currents of air, a frame divided into the three compartments already described, was placed, and subjected to an intense heat. The result of the experiment was, that while the suppositious floor of the apartment beneath was wholly destroyed, the upper stories of the model-house were preserved safe; and in these respects—viz., that when No. 1, or the floor unprotected by the cement, grew hot, the rest—namely, divisions two and three, were respectively in comparative degrees of coolness. The singularity and advantage of the composition is, that it is equally applicable to old and new buildings. In a word, it is unnecessary to say more than that the principle has been extensively adopted in Lancashire and other northern counties, and only requires to be understood and estimated to command general approbation.

ADVERTISEMENTS.

HYDRAULIC BELT, or WATER ELEVATOR. Mr. DYSON, C. E., having arranged the Machinery for the perfect application of the Belt to the Drainage of Lands, will submit this novel performance to PUBLIC INSPECTION, on WEDNESDAY, the 9th inst., in the Fens, near Downham Market, Norfolk. Further particulars may be obtained at the Offices of Mr. BEBB, 20, Great Marlborough-street, Regent-street, London, Solicitor to the Patentee.

COLLEGE for CIVIL ENGINEERS.—NOTICE IS HEREBY GIVEN, that CLASS III. of Contributors (£1,000) in the prospectus is CLOSED, and that consequently no further contribution of £1,000 will be received on the conditions of that class from the date of this notice. By order of the Council,

Aug. 26. J. E. B. CURTIS, Secretary.

COLLEGE for CIVIL ENGINEERS.—NOTICE IS HEREBY GIVEN, that the College has been removed from the temporary premises at Kentish Town to very spacious and airy freehold premises at Putney, the purchase of which has been effected by the Council; the students reassembled on Thursday the 13th inst.

By order of the Council,
J. E. B. CURTIS, Secretary.

Every information as to terms, mode of admission, and the general regulations of the College, may be obtained by application to the Secretary, at the Office.

Office, 9, Villiers-street, Strand.
July 22, 1840.

TWEEDDALE DRAIN TILES.—Land-owners and others, requiring supplies of DRAIN or other TILES, may obtain them from the Company's Establishments at

Hanwell, Middlesex.	Broom-hill, near Alnwick, Northumberland.
Brixton-hill, Surrey.	Thatcham, Berks.
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on orders being sent to either of the above places, or to the Company's office, No. 10, Whitehall, Westminster.

MAGNIFICENT MODEL OF HOBART TOWN, &o. &c.

JUST arrived from the Antipodes, and exhibiting daily at the Gallery of the Society of British Artists, Suffolk-street, Pall-mall East, under the especial sanction of the Honorable the Lords of the Treasury, &c. Mr. G. PECK's wonderful and extensive MODEL of HOBART TOWN, the capital of Van Dieman's Land.

The Model of Hobart is constructed upon a scale of 20 feet to an inch, and includes every building, large or small, in that romantic and interesting town, and comprises an area of more than ONE THOUSAND SQUARE FEET, forming one of the most wonderful and interesting works of Art ever beheld, which cannot be truly described, but must be seen to be believed.

Also two SPLENDID MOVING PANORAMAS, from accurate drawings taken on the spots, consisting of Sydney, the Capital of New South Wales, and the Environs of Hobart Town. Admission ONE SHILLING. Discriptive guldes, 6d. each. Open from 10 till dusk.

PLATOW'S PATENT AUTOMATON COFFEE URN.—The peculiar excellence of this invention, consists in the application of a series of natural processes to the preparation of coffee. The boiling water is raised by the elastic pressure of steam into a separate vessel, remote from the fire; where the coffee is kept simmering with the nicest regulation as to time, and the degree of heat. When the elevation is complete, the coffee is instantaneously cleared by the pressure of the atmosphere, acting on a self-formed vacuum. By following the directions given, any person, however little conversant with cooking, may prepare as good coffee as it is possible to make (see "Inventors' Advocate," No. 57, and the "Mechanics' Magazine.") Sold at moderate prices by all ironmongers.

RAILWAY MAGAZINE, AND COMMERCIAL JOURNAL. Railways, Banks, Mines, Steam Navigations, Assurances, Public Works, &c.—This long-established and entensively-circulated Work, which has attained the greatest celebrity for the value of its Articles, and its uniform success in all causes it has advocated, is now published WEEKLY, price 5d. stamped, and consisting of 16 closely and handsomely printed pages. It contains full and accurate Reports of all Railway and other Joint-stock Company Meetings; Steam Navigation; Asphalte; Accounts of New Companies, Banks, Mines, Assurances, Canals, Docks; a most important table to all travellers of the times and fares of all Railway Trains throughout the kingdom; unique and valuable tables of the prices of Railway and other Shares, Paper Money in circulation, Metals, Traffic of Railways, Meetings, Calls and Dividends, General, Mechanical, and Scientific Intelligence. A Tide Table for every day in the Week for each Port frequented by Steam Vessels.

Orders received by all News Agents, and at the Office, 3, Red-Lion-court, Fleet-street, London; Messrs. Arnold, Liverpool; Mansell, Birmingham, &c.

Light-House, 201, Strand.

BY HER MAJESTY'S LETTERS PATENT.

S. JONES, INVENTOR AND PATENTEE.

The FOLLOWING Indispensable articles of DOMESTIC USE, LUXURY, and GENERAL PUBLIC UTILITY, ARE ON SALE AS ABOVE:—

THE FAMILY SAFEGUARD.

JONES'S PHOTOLYPON; or, SELF-ACTING LIGHT EXTINGUISHER.

"This is one of the most simple, ingenious, and at the same time one of the most valuable of modern inventions,—inasmuch as it may oftentimes prevent the loss of human life. It is so constructed that, without soiling the fingers, it can be readily placed over a candle, and so adjusted as to cause the light to be extinguished *at any precise moment of time*. No invalid, mother, nurse, or book-worm, should be without it; it is indeed an indispensable adjunct for *every* establishment."—*The Inventors' Advocate*, No. 12.

INSTANTANEOUS LIGHTS.

JONES'S PROMETHEANS.—The advantages the Promctheans possess over all other instantaneous lights, are their extreme simplicity and durability, as neither time nor climate can impair their original quality. They are composed of a small glass bulb hermetically sealed, containing about a quarter of a drop of Sulphuric Acid, encompassed by a composition of the Chlorate of Potash, enclosed in Wax Papers or Wax Tapers; the latter will burn sufficiently long for scaling two or three letters. The PROMETHEANS being pleasant to use, and never failing in their purpose, are rendered nearly as cheap as the common Lucifers.

JONES'S LUCIFERS, OR CHLORATE MATCHES, for producing instant light, by drawing the match briskly through the sand paper; and warranted to keep good in any climate; care should be taken when using the lucifers, to avoid inhaling the gas that escapes from the combustion of the black composition, the effect of which is a degree of suffocation, head-ache, and nausea.

CONGREVES, VESTAS, &c., for Lighting Cigars; FIRE-BOXES, and FLOATING LAMPS.

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ARTICLES IN THE CULINARY DEPARTMENT.

THE SPORTSMAN'S DESPATCH, to carry in the pocket. It will cook a chop and boil a pint of water.

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THE PERIPURIST, and CONJUROR, and OTHER ECONOMICAL KITCHENS, for BOATS, PARTIES of PLEASURE, &c. &c.

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H. WALKER'S NEEDLES (by authority "the Queen's Own"), with the new eyes of increased size, and improved points, are now in course of delivery to the trade. They are easily threaded, work with great freedom, and are more durable than any others. The new labels, to protect the public against imitation, consist of a very beautiful set of profiles, equestrian figures, &c., of Her Majesty and His Royal Highness Prince Albert, in very bold relief, on colored grounds. The style is truly novel, extremely elegant, and very generally admired.—H. Walker's HOOKS and EYES, manufactured by his improved machinery, are well worthy of notice. The boxes bear his name on an engraved label, showing the size. Sold also on cards by the principal dealers.—H. WALKER, 20, Maiden-lane, Wood-street.

Mining Journal Office, 37, New Broad-street, City, 27th June, 1840.

NEW WORK ON THE IRON TRADE.—The Number of the MINING REVIEW this day published, contains the Sixth Part of the Paper on the IRON TRADE, by Harry Scrivenor, Esq.—this work will be completed in Twelve Monthly Parts, and so arranged as to form a separate volume at the end of the year; in addition to which the MINING REVIEW contains—A Paper on the Establishment of a School of Mines—On the Ventilation of Mines, by Samuel Moyle, Esq., C.E.—On the Preparation of China-Clay, by W. J. Henwood, Esq., F.R.S., &c.—On Blasting Limestone Rock, being an Account of Blasting the White Limestone in the Country of Antrim, Ireland, by William Bald, F.R.S.E., M.R.I.A.—On the Applicability of Peat to Manufacturing Iron—Parliamentary Returns of the Imports and Exports of Copper, Lead, and Tin, for the year ending 5th January, 1840—Scientific Bodies, &c.—The MINING REVIEW is published at the office, as above, on the 1st of each month, price Sixpence.

The MINING REVIEW is also furnished, to subscribers, as a Monthly

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The "MINING JOURNAL" is published at two o'clock every Saturday afternoon, at the office, 37, New Broad-street, City, to which address all Advertisements and Communications are requested to be addressed. Price 6d., and may be had of all booksellers and newsvendors in town and country.

THE SHIPPING AND MERCANTILE GAZETTE, London Evening Journal of Maritime, Commercial, and Political News,—combining all the essentials of a Daily Newspaper, with the prominent features of complete and exclusive intelligence on every subject connected with the Shipping and Trade of the United Kingdom The Shipping Gazette has obtained a character for correctness and usefulness unprecedented in the annals of Newspapers. It now commands an extensive circulation throughout the United Kingdom and the Colonies, on the Continent of Europe, in the United States of America, and other foreign countries; and is therefore a most eligible medium for commercial and miscellaneous advertisements, particularly those that relate to the sale, charter, freight, equipment, and sailing of vessels, and the sale of merchandise, and that have for their object the particular attention of Merchants, Ship-Owners, and Mariners, and those having dealings with them. The establishment of the Shipping Gazette forms a new era in the history of Shipping Intelligence; comprising, as it does, daily and complete announcements of the arrival and sailing of all vessels, in the coasting and foreign trades, together with an accurate account of vessels spoken at sea; state of winds and weather; accidents; losses; rates of foreign and coasting freights; premiums of insurance; wholesale prices of goods; stock-exchange news; coal, corn, and other markets; which information is regularly furnished and derived from the most authentic sources at home and in foreign countries trading with Great Britain. The Shipping Gazette further embraces a comprehensive detail of domestic and miscellaneous intelligence; records of all important events; reports of parliamentary proceedings, public meetings, decisions of law and police courts, &c., especially such as refer to nautical and commercial matters; and altogether contains a larger mass of information than is afforded by any other Evening Newspaper. The Shipping Gazette is frequently referred to by witnesses examined before Committees of the House of Commons, as furnishing the most authentic evidence on maritime affairs. Orders, communications, and advertisements for the Shipping and Mercantile Gazette, are received by its Agents at the respective out-ports, and by any News Agent in town or country. Advertisements and communications to the Editor, may be sent to the Publication Office, No. 54, Gracechurch Street, London.

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The object for which this Company has been formed, namely, to enable every person to manufacture their own ale and porter of genuine malt and hops, (an article of such paramount importance to the community at large,) without the usual requisite of brewing, or the use of brewing utensils, and to any strength or extent their station in life may require, at one-half the expense, and without trouble or loss of time,—must strike every person as being of the greatest national importance, and that the most profitable results must arise from such an undertaking.

To carry this desirable object into operation, the projectors of this Association, fully convinced of the efficacy of Jarvis's Patent Concentrated Extract of Malt and Hops, which requires but the simple and easy process of undergoing a fermentation, have made arrangements to secure its important advantages to the Company, and that benefit, so important to the public at large, which must result from its adoption.

The simplicity of the process, the genuine and excellent quality of the beer made from the extract, and the reasonable price at which it can be obtained, render it almost a matter of certainty that the National Brewing Association must ultimately supersede all other brewing establishments, unless availing themselves of the advantages offered by this patent.

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For prospectuses or shares, on which £1 per share deposit must be paid, apply (pro. tem.) to W. H. Lammin, Esq., solicitor to the Association, at his office, 5, John-street, Adelphi, on or before the 1st day of September next, when a Meeting of the Shareholders will be convened, for the election of Directors and other officers.

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MR, HOLMES'S VALUABLE PATENTS.

HOLMES'S PATENTS, for IMPROVEMENTS IN THE CONSTRUCTION OF IRON SHIPS, BOATS, AND OTHER VESSELS; also in Means for Preventing the same from Foundering, also in the Application of the same Improvements or parts thereof to other vessels.

Also

HOLMES's Patent for Improvements in Naval Architecture, and Apparatus connected therewith.

"All persons who examine this patent, must admit Mr. Holmes to have fully established the principles insisted on in his report to the East India Committee, in 1838, of the practicability of building iron ships without limits to size, and on the indispensable necessity of the adoption, not only of much larger ships than had been contemplated, but that it was equally indispensable, in point of profit, that they should be built of iron, and by the adoption of his improvements a great reduction in the first cost and in the wear and tear would be effected. Many parts of these improvements are, however, equally applicable to wood ships, as regards safety to the passengers; and wherever they are adopted, we cannot conceive any case or circumstance in which a ship can be placed in danger. In the fullest sense of the word, they become life-boats, without waste of room, or extra cost."—*From the "Inventors' Advocate," July 1.*

Applications for licenses to be made to Mr. HELPS, 21, Cornhill, London, or to Mr. HOLMES, Civil Engineer and Naval Architect, 5, Cannon-row, Westminster, where Plans and Specifications are prepared, with every practical detail for the Builder's Contracts for every Class of Iron Vessels.

FOR THE HOME AND EXPORT TRADE.—

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The much approved Patent India-Rubber Goloshes are light, durable, and perfectly waterproof; they thoroughly protect the feet from damp and cold.

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PROPRIETORS OF

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N.B. A Solicitor is in attendance, daily, from Eleven till Two o'Clock, who may be consulted on all points of PATENT LAW.

London: Printed by JOHN EAMES, 7, Tavistock-street, in the parish of St. Paul, Covent Garden, in the City of Westminster; and Published for the Proprietors, by WILLIAM KIDD, at the Office, 7, Tavistock-street, Covent Garden, (as aforesaid) to whom Books, &c. for Review, (addressed to the Editor), should be forwarded. Saturday, September 5th, 1840.

THE

INVENTORS' ADVOCATE,

AND JOURNAL OF INDUSTRY;

A WEEKLY BRITISH AND FOREIGN MISCELLANY OF

INVENTIONS, TRADE, MANUFACTURES, LITERATURE, AND THE ARTS.

PRINTED BY JOHN EAMES, 7, TAVISTOCK STREET, COVENT GARDEN.

No. 59.] SATURDAY, SEPTEMBER 12, 1840. PRICE FIVEPENCE STAMPED. CIRCULATING FREE BY POST.

INJUSTICE TO INVENTORS.

We have, on many occasions, pointed out the neglect of our government to encourage the efforts of inventive genius, and the injustice and hardship to which inventors are exposed when they attempt to secure the products of their own labors by patents. The following article in the *Moniteur Industriel* touches on the same subject, and in parts almost goes over the same ground that we have taken. The complaint is, in this instance, against the French government; but it is almost equally applicable to our own. The injustice practised towards inventors, compared with the treatment of authors, is very forcibly put by the writer in the *Moniteur*. The whole article, indeed, is well deserving perusal, and we are glad to find that the same subject we have directed attention to in this country, is also exciting animadversion on the Continent:—

"Which class of men has produced the greatest revolutions in the world; which has had the greatest and most extended influence on the condition and existence of the human race? In our opinion, it is not conquerors nor philosophers, but *inventors*. In fact, is it not to inventors that we are indebted for the plough, the mill, the distaff, ships, paper, the mariner's compass, the steam-engine? powerful and beautiful instruments, by the aid of which men are enabled to pass from a state of slavery to civilisation, from misery to riches, from nothing to life.

"Even now, what occasions the difference between different nations? Why do the Iroquois Indians differ from the people of Europe? The cause of it is, that the Iroquois have no inventors; the people of Europe have. The nations most advanced in civilisation, are those who possess the greatest number of inventors; those who are most behind, are those who have the least.

"Yet, notwithstanding the important influence of inventors on the destinies of men, look at their condition—look at the position in which inventors are placed! Jacquard, who turned his attention to the manufacture of silk, discovered the means of weaving them with greater facility and of a superior quality—and they burnt his machines! Fulton invented steam navigation, and the Academy of Sciences at Paris proved that that mode of applying steam was impossible! The inventors of the stocking-loom, of lighting by gas, of the preparation and spinning of flax by machinery, and a number of others, after having benefited the world by great and splendid discoveries, have been neither more fortunate nor better recompensed.

"But, it will be said, how is it possible to distinguish, among the thousands of inventions which are coming to light every day, the good from the bad? We know it is not an easy task; but, because there are difficulties attending it, it is not, therefore, impossible. Because we are not yet in possession of the formulæ for resolving the problem, that is no reason why nothing should be done—why we should leave to the chances of fortune one of the finest and most important divisions of the labors of man's genius.

"In France, the government has instituted prizes for the fastest horses; secret funds for men of letters; subsidies for the theatres: but it has instituted no reward or encouragement for inventors; nothing for those men to whom humanity is indebted, if not for all its civilisation, at least for its most numerous and powerful means of becoming civilised.

"And the law of patents; the civil condition of the property of inventors? We must say a word respecting this law, for it is all that in France has hitherto been thought necessary on behalf of inventors. A man sometimes, after the reflection of a moment, by an inspiration of genius, more frequently after numerous combinations and laborious studies, presents himself to the government, and says, "I have invented the means of multiplying the powers of production of the country; or, I have discovered the secret of increasing the enjoyments of man, of supplying real and universal wants." The government answers, "Let us know your invention, your secret, that we may make it known to all; and if you desire to become the owner of your own property, during five, ten, or fifteen years, give us 500, or 1,000, or 1,500 frs." That is to say,—inventors, because you have made a discovery which belongs to you, you are obliged to pay an enormous sum to become the owners of it! You are, in fact, condemned to pay a fine for having benefited your country, for having searched for, for having found, perhaps, the means of infinitely multiplying her riches and her power.

"But the government acknowledges and promises to protect the ownership? Yes, on condition that the inventor shall discover the counterfeit, and pay all the expenses of prosecution—a considerable cost, which alone may often ruin the inventor of a perfect piece of mechanism. And the same government grants, without any fiscal impost, or any fine, the property of a bad book to a bad author, not only during all his life, but even for thirty years after his death. What shall we think of a treatment so considerate in the one case, and so harsh in the other. The government, in pursuing this course, has evidently not considered that an invention is the same, whether it be manifested in the composition of a book, of an opera, or in the fabrication of a machine. And yet they are in effect similar.

"What is requisite to make a book, an opera, a machine? *Time, genius, money, and preliminary study*, as M. Jobard has judiciously observed. Lamartine combines verses and rhymes; Mayerbeer minims and crotchets; Ingres, lines and colors; d'Arcet, acids and alkalis; David, statues; and Perrot, machines more exact than the hand of man. All pursue the same work,—the work of thought and genius; all have the same object,—the discovery of a new truth; and their labors have the same result,—the attainment of an object useful or agreeable to man. And yet all have not equal rights; the government, whilst its secures the ownership of the one, forgets that of the other! Is it that the steam-engine is not of equal importance with the *Henriade;* the spinning-jenny with the *Stratonice;* Jacquard's loom with the Church of Magdelen; railroads with the pediment of the Pantheon; the Perrotine with *Robert le Diable;* and gas lights with a sonnet?

"But even were the government to place all claims on an equal footing, it would not do enough; for there are inventions which cannot be carried into practice without great expenses,—without experiments which an inventor is seldom able to make. It would be as much for the interest of the country as for the interest of inventors, if there were a permanent council established, composed of scientific and practical men, to which council the government were to entrust sufficient funds to prove by complete experiments the merits of inventions that might be submitted for their inspection. If France had always possessed such a council, and if it had properly discharged its duty, our national industry would now be in a more advanced state, our powers of production would be increased, and our national wealth would be greater.

"We might cite a hundred instances of inventions, against which there is no theoretical objection, excepting that they have not succeeded; and which never can succeed, and advance from theory to practice, if the government will not assist the inventors who have conceived the plans. M. Dietz, jun., has constructed a steam tug, for running upon common roads, to which the Academy of Sciences, on examining it, could find no objection, and yet it

is not in action. Would not the government be doing a great service to the country, by determining the question, whether steam carriages cannot be employed on common roads, either according to the plan of M. Dietz or some other? No engineer can maintain that steam carriages on common roads are impossible, since that of M. Dietz, such as it is in its rough state, has already travelled six hundred leagues without requiring any important repairs. Another engineer, M. R. de Wilback, has contrived a train of carriages, with which the curves of railways might be easily traversed, and without danger. The government attends no more to this invention than if it had never existed; and yet the same government authorises the construction of railroads, interests itself in the execution of those undertakings,—though it pays no attention to an invention which promises to save probably millions, by enabling railroads to be made in a manner which cannot be done when the ordinary carriages run on them.

"What is the effect of this carelessness of the government respecting inventions? Perhaps many skilful engineers have worn out their lives in combining excellent inventions; perhaps the country will be deprived of inventions, which would have increased the national wealth and prosperity."

IMPROVEMENT IN THE MODE OF BOREING TO GREAT DEPTHS.

A new and ingenious arrangement of the apparatus for boreing the ground at great depths, has been made by M. d'Oeynhausen, director of the mines of the arrondissement of Bonn, which he has employed with complete success in the boreing which the Prussian government has ordered to be made at the salt pits of Neusalswerk, near Mindeu, for the purpose of discovering the salt springs. Two methods have hitherto been chiefly adopted in boreing; one of which is to suspend the boreing tool by means of a cord; the other, to fix it at the end of a metallic rod, usually consisting of a number of divisions, fixed together by screws. Each method has its advantages and its inconveniences; and the nature of the soil must determine which is the best to be used in each particular case. Experience seems to show, that the cases in which the plan of using a cord can be adopted advantageously, are much more limited than was at first supposed. For instance, when the boreing is made through a soil, the nature of which is not known, or when it is expected that the tool will have to perforate rocks, of different degrees of hardness, it is generally found better to employ the metallic rods, because they afford more means than a cord for overcoming any unforeseen difficulties. Notwithstanding this advantage the use of rods is attended with great inconvenience, especially when the boreing is very deep; which no means had hitherto been found to overcome. At a certain depth, the rods become so long and so heavy, that they bend with their own weight, and by the effect of the blow. This occasions a lateral pressure against the sides of the bore, and produces a considerable enlargement of the hole. As the size of the bore increases, the bending and vibrations of the rod increase also; which occasions pieces of soil to fall from the sides, and produces such frequent breakings of the rod that the work is frequently obliged to be abandoned. The violent blows requisite from the great length of the rods, have also this inconvenience, that they rapidly destroy the joints of the rods, and so completely change the structure of the iron of which they are composed, that the metal loses its cohesive property, and is consequently more easily broken.

These difficulties were encountered in an extreme degree in the boreing of Neusalswerk. The strata through which it penetrates, are some of them very soft, and others extremely hard. When the chissel strikes at a depth of 200 metres on the hard rock, the bending and vibrations of the rods act upon the soft strata, previously bored through in such a manner that the diameter of the hole is increased to more than three times its original size. The rod also broke so often, and it was so difficult to mend it, that the boreing was about to be abandoned.

In the plan of boreing with a cord, none of the difficulties mentioned above occurs; since by the nature of the apparatus, it cannot receive the reaction of the blow of the tool, nor injure the sides of the bore. If this reaction could be prevented where rods are used, and if, after the blow of the tool, the greater part of the rod were suddenly detached from all connection with it, and suspended in the hole in a vertical position, it is evident that the difficulty would be completely overcome.

This is what M. d'Oeynhausen has accomplished, by a very simple and ingenious apparatus. The best praise that can be given to the invention, is to mention the following results attending it:—

The boreing which could not be continued with the former plan, when the tool had only reached a depth of 263 metres, has already been carried, without any further impediment, to a depth of 403 metres. A great diminution in the expense, results also from the diminution of the weight of the rods. This diminution is so great, that the rods now employed do not weigh one quarter so much as those before used, and the total saving of weight on the whole system of rods, compared with the weight at the former depth, amounts to 1,760 kilogrammes, which is equal to 3,800 lbs. According to the old plan of working, at the present depth of 403 metres (about 1,400 feet), the total weight of the rods required would have been 10,144 kilogrammes, whilst those at present employed weigh only 3,405; being a saving of 6,739 kilogrammes in the weight.

This apparatus of M. d'Oeynhausen, is employed not only in the boreings at Neusalswerk, but also at two other salt-pits in Prussia, with equal success; one of the boreings having been sunk to a depth of 310 metres, the other to 250 metres. In neither of those boreings, any more than in that at Neusalswerk, had the rods suffered the least injury since the introduction of the new plan.

EXPIRED PATENTS.

PATENTS THAT HAVE EXPIRED DURING THE WEEK ENDING SEPT. 5, 1840.

ENGLAND.

WILLIAM DAY, of the Strand, trunk and camp equipage maker, *improvements on bedsteads, which improvements are applicable to other purposes*, Aug. 31.

SPECIFICATIONS.

A LIST OF SPECIFICATIONS

ENTERED AT THE ENROLLMENT OFFICE, UP TO THE WEEK ENDING SEPT. 5, 1840.

(*Continued from page* 148.)

ENGLAND.

JOSEPH SHORE, of Birmingham, Warwick, merchant, *improvements in preserving and covering certain metals and alloys of metals*, Sept. 3.—This claim is for obtaining a permanent coating of copper or nickel, upon manufactured articles of wrought or cast iron, copper, tin, lead, &c., as also a smoother and more durable surface, by means of galvanic action.

The process employed is similar to that in use for the purpose of producing copies of medals, engraved plates, &c., by causing a solution of a salt of copper to be deposited in a solid form upon a metallic body, as is well understood; the thickness of the coating of copper depending upon the length of time the articles remain under galvanic action.

The objects to be coated, are to be well cleansed by any of the usual means; the inventor recommends the application of heat, when practicable. His method is to place the articles in a crucible, covering them carefully with sand, pulverised charcoal, or black lead, and then to raise the crucible to a low red heat, and after having allowed it to cool gradually, the articles may be withdrawn, cleared from dust, and subjected to the galvanic action.

JAMES HORNE, of Clapham Common, Surrey, gentleman, *improvements in the stuffing boxes of lift pumps*, Sept. 3.—The peculiarity of this invention consists in combining in each stuffing box two cupped leathers inverted, with their bases towards each other, and having between them a flat disc of metal; the flanch of the lower cupped leather rests upon a projecting ledge, cast upon the inside of the stuffing box, and that of the upper cup is forced down by a similar projection in the cap of the stuffing box, in such a manner that on the rising of the piston rod (which passes through both the leathers and the metallic disc) the lower leather will resist the pressure of the fluid from below, and the upper leather that of the atmosphere from above, on the return of the piston rod.

JOHN RANGELEY, county of Surrey, gentleman, *improvements in the construction of railways, and in the means of applying power to propelling carriages and machinery*, Sept. 3.—The moving power in this invention is obtained from a stationary engine or engines, and is transmitted through a series or train of wheels fixed on axles, revolving on stationary bearings, which are attached to longitudinal rails, supported on sleepers in the usual manner. Drums are fixed to the axles of the wheels, and endless straps or bands being passed round them, by means of two grooves on each drum, the motion is communicated from one wheel to the other, throughout the whole series.

The carriages rest upon the tops of four pair of the above mentioned wheels; a long iron rail, called a running rail, being attached to the under part of the carriage, in the line of contact with the wheels.

The claim is for transmitting power through a train of wheels revolving in fixed bearings, and for causing the carriages to pass over and upon these wheels, and be propelled by the friction of their peripheries against running rails attached to the under side of the carriages.

JOHN SYLVESTER, of Great Russell-street Bloomsbury, engineer, *improvements in the construction of doors and frames for closing the openings of fire-places, ash-pits, flues, chimneys, and certain retorts*, Sept. 3.—The faces of the doors and door-frames must be wrought to a true surface, so as to cause them to shut quite close, without the aid of latch or other fastening. The door frame is not set truly perpendicular, as in the ordinary method, but is inclined several degrees from the vertical plane. Two links are hinged at one extremity to nearly the middle of the door, the other ends are carried upwards and formed into two eyes, which pass over and round a horizontal bar fixed above the door-frame, and thereby suspend the door in such a manner that it shall always have a tendency to fall with its centre of gravity under the point of suspension, by which means it will always be kept closed; when required to be opened, the door is slid horizontally along the bar, being kept in its place by two ledges prolonged from the top and bottom of the door-frame.

Two other modifications are shown in the drawing, which it is unnecessary to describe; and lastly, as regards the mouths of retorts, in which an outward pressure may occur, greater than could be overcome by the mere gravity of the door, in the method just described,—then the door is caused to press upon its frame with a proportionate increase of force, by removing the point of suspension further from the plane of the truly wrought faces of the door and door-frame.

The claim is for suspending the doors of fire-places, ash-pits, flues, &c., in such a manner that their tendency to fall with their centre of gravity immediately below the point of suspension, shall cause them to press with sufficient force against the door-frame to keep it tight without latch or other fastening.

JOSEPH CLISILD DANIELL, of Simpley Stoke, Bradford, Wilts, *improved method of preparing shoot or weft, to be used in weaving woollen cloths, and cloths made of wool and other materials*, Sept. 3.—The improvement consists in combining two, three, or more fine yards or threads into one, by doubling, trebling, and laying them together, and afterwards twisting them, or not, so that the combined yarn to form shoot, or weft, when completed, shall not be heavier or coarser than the single yarn usually employed, at the same time that it will possess much more strength, be less liable to be broken in the process of weaving, and better enabled to bear the action of the teazles, or substitutes for teazles, used in raising the pile.

If it is intended that the yarn shall only be doubled, in order that the thread or yarn when so doubled and twisted shall not exceed in substance or weight the single spun yarn in ordinary use, the inventor causes it to be spun by an ordinary spinning jenny, or mule, to such a fineness that there shall be 36 skeins to the pound weight, where there would be only 18 of the ordinary yarn; and if intended to be trebled, it is spun into 54 skeins to the pound.

Two, three, or more cops or bobbins of this prepared yarn are then stuck upright upon spindles in a winding machine, and a thread from each is carried up and passed through an eye or loop, and being thence carried over and under two stationary rods or wires, is acted on by the faller wire, as is well understood, and is thereby caused to be doubled, trebled, and laid together in the form of a cop upon a tube, stuck upon an upright spindle, caused to revolve by a pulley on its base, connected by a band with the wheel of the winding machine.

The tube, with the cop of combined yarn formed upon it, is now taken off the winding machine, and carried to the twisting machine, and the end of the yarn being carried up through an eye, as usual, is wound off in a skein upon a reel, being at the same time closely twisted together, by causing the revolving spindle upon which the tube is placed, and the reel, to acquire differeut velocities, by means of bevilled wheels, &c.

The skeins are next doffed and carried to the quill machine, to be wound upon the quills or puns, for the shuttles of the weaver; if in the weaving of some kinds of woollen cloths, it may be desirable to avoid the expense and trouble of the twisting machine, the yarns may be combined by simply placing them in separate skeins upon the reel of the quill machine, and thence winding them upon the quills.

The claim is for preparing shoot by combining two, three, or more yarns into one, to form shoot for weaving, whether they be so combined by twisting or otherwise.

ENTERED AT THE PETTY BAG OFFICE, UP TO THE WEEK ENDING SEPT. 5, 1840.

(Continued from No. 58.)

ENGLAND.

THOMAS MILNER, of Liverpool, Lancaster, safety box manufacturer, *certain improvements in boxes, safes, or other depositories for the protection of papers or other materials from fire*, Aug. 26.—An iron box or frame encloses two, three, or more cases or partitions, having spaces between each of them, which are to be filled with some absorbent material, such as porous wood, wood dust, bone dust, &c. A series of tubes, vessels, or pipes are inserted, so as to be surrounded by the absorbent; these vessels are to be filled with an alkaline solution, or other liquid, and which, on the box being subjected to the action of fire, will be burst by the expansion of the boiling liquid within them, and thereby cause the porous materials to be saturated with fluid, which is to prevent the fire from taking any effect upon the papers deposited in the inner box.

Claim is made to the application of vessels containing a liquid, in combination with any absorbent matter, by which means the latter may be kept humid, in case of fire.

JOHN WILSON, Liverpool, lecturer on chemistry, *improvements in the manufacture of carbonate of soda*, Aug. 19.—Consist in using bicarbonate and sesquicarbonate of soda in preparing common carbonate of soda. The inventor obtains carbonate of soda from sulphurate of sodium, by adding one equivalent, or 85 parts of bicarbonate, to one equivalent, or 48 parts of sulphurate of sodium.

He also obtains carbonate of soda from the black ash usually produced by decomposing sulphate of soda, by adding bicarbonate of soda in relative proportions to the caustic and carbonate of soda contained in the black ash.

Claims the use of bicarbonate of soda, and sesquicarbonate of soda, in obtaining carbonate of soda from sulphurate of sodium, and also from the black-ash obtained by decomposing sulphate of soda in the usual manner.

JOSEPH NORTON, of High Bridge Mill, near Clayton, West High Hoyland, York, manufacturer of fancy cloths, and GEORGE COLLIER, of Skelmanthorpe, High Hoyland, and Emley, York, mechanic, *improvements in looms for weaving figured and twilled fabrics*, Sept. 3.—The advantages claimed, are the means of causing the warp used in weaving fancy cloths to be shed both ways, instead of only one way as heretofore practised, that is, upwards and downward at the same time, thereby affording the means of giving much greater variety to the patterns.

There are two sets of jacks, one at the top of the frame and the other at the bottom, the improvements are shown as applied to the lower set, although equally applicable to the upper. Treadles, healds, and harness connect the two sets together.

The jacks are mounted by their middles on a fulcrum fixed to the framing of the loom, and have at each of their extremities a projecting stud or pin, sufficiently long to be caught and acted on by the respective jack depressers, care being taken not to make them so long as to interfere with the neighboring set of jacks. Guides are placed between each set, to keep them steady, and prevent all lateral motion.

The jack sinkers are strung, hanging loosely from a rod, fixed at each end into a pair of long levers, having a fulcrum in the framing at one end, and being united at the other end by a cross bar, from which rises the bridle-rod, taking hold of a hollow lever. In the hollow of this lever works an eccentric, driven by the main shaft, and which, in revolving, communicates an alternating up and down motion to the side levers and jack sinkers. Each pair of jack sinkers are connected near the top by a long rod, in such a manner that one end can only be depressed at a time, the other end being raised up, and leaving its corresponding jack at rest, and which, in its turn, being selected and depressed, causes the warp to be shed both up and down.

The stud wheel, over which the endless chain passes, carrying the studs or projections which regulate the patterns, is mounted on a frame, to which a rocking motion is communicated, by means of levers connected with an eccentric on the main shaft, which causes it to advance to, or recede from the edges of the jack sinkers, which it selects and depresses according to the "reading off" of the stud chain.

The whole of the jacks are so contrived as to fall into and preserve, when at rest, one smooth front, so as to be ready to be acted on by any of the depressers, which may be selected and forced down by the studs on the chain.

WILLIAM CRAIG, of Glasgow, engineer, and WILLIAM DOUGLAS SHARPE, of Stanley, Perth, engineer, *certain improvements in machinery, for preparing, spinning, and doubling cotton, flax, wool, and other fibrous substances*, Sept. 3.—The objects of this patent are to make self-acting, those parts of the ordinary loom which have been hitherto regulated by the hand of the weaver.

The machinery by which this is accomplished, consists of a peculiar arrangement of wheels, levers, and catches, which are all actuated at the proper time by motion communicated from the main shaft, but which cannot be described or properly understood without the aid of a drawing; we shall therefore confine ourselves to a description of the principal parts claimed.

First.—The application of wheels and catches to the shaft, generally known in hand looms as the power-shaft, by which the motion for backing off and carrying up the mule carriage is effected.

Second.—The application of a toothed rack for the purpose of raising the faller, and retaining it in a proper position for effecting the winding of the yarn upon the cop.

Third.—Inclined planes applied to the tooth-rack.

Fourth.—A double eccentric wheel for bringing up the carriage to the roller beam, and which gives it a variable velocity.

Fifth.—The method of reversing the action of the mule carriage and spindle, by a spring or other power compressed and retained until the mule carriage has reached the roller beam, when by suitable levers and gear the motion becomes reversed.

Sixth.—The application of a conical or spiral wheel, whether fixed in the mule carriage as shown, or otherwise, for the purpose of giving out and winding off the yarn.

NOTICE.

In accordance with the determination expressed in our 26th Number, of giving one month's clear notice to Inventors, before publishing their specifications, we hereby inform the following Patentees, that their specifications will be published in the "INVENTORS' ADVOCATE" of Oct. 17. Each party will receive, in addition, a *private* communication to the same effect.

Harrison Blair, of Kearsley, Lancaster, manufacturing chemist, and
Henry Hough Watson, of Little Bolton, in the same county, chemist, due Oct. 6.
Richard Beard, of Egremont-place, New Road, du Oct. 6.
Edward Thomas Bainbridge, of Park-place, St. James's, due Oct. 13.
Thomas Young, Queen-street, City, merchant, due Oct. 13.
James Caldwell, Mill-place, Commercial-road, engineer, due Oct. 15.
John Gold, of Etna Glass Works, Birmingham, glass manufacturer, due Oct. 15.
William Potts, of Birmingham, brass-founder, due Oct. 15.
Louis August de St. Sylvain, Baron de Los Balles, of Nottingham-street, Marylebone, due Oct. 15.
William Grimman, of Camden-street, Islington, modeller, due Oct. 15.
Joseph Whitworth, of Manchester, engineer, due Oct. 15.
Thomas Robinson Williams, of Cheapside, due Oct. 15.
William Unsworth, of Derby, silk lace manufacturer, due Oct. 16.
Samuel Wilkes, of Darleston, Stafford, iron-founder, due Oct. 16.
William Henry Bailey Webster, of Ipswich, surgeon, R. N., due Oct. 16.
Samuel Marlow Banks, of Bilston, Stafford, due Oct. 16.
Robert Cooper, of Petworth, Gloucester, due Oct. 16.

FOREIGN PATENTS.—FRANCE.

THE FRENCH GOVERNMENT HAS DECLARED THE FOLLOWING TRANSFER OF PATENTS VALID.

No. 1. To David and Loth by Caïman Duverger, for *a pedal and (à rocher?) spinning machine, called by him "filoir sans roue,"* granted Oct. 9, 1834.—May 2, 1838.

2. To Loth, by David, all his interest in the above patent, Oct. 2, 1838.

3. To Anger Croué, by Jecquier Landry, and Favreace, Etienne, for *a paper-making machine*, granted July 23, 1830.—June 28, 1838.

4. To Lemaistre and Chauvin, by Domingue and Boudet, for *a chemical process for preparing all kinds of skins to be tanned and tawed*, granted Dec. 5, 1833.—Sept. 8, 1838.

5. To Boudet, Lemaistre, and Chauvin, by Domingue, for the above invention, Oct. 1, 1838.

6. Boudet, Lemaistre, and Chauvin, for working the patent granted to Boudet and Domingue, as above, No. 4.

7. To Delaroque, by Hutinot, for *a pump*, granted July 12, 1837.—Oct. 2, 1838.

8. To Polonceau, by Marion de la Brillantais, for *new uses of tars and bitumens*, granted Aug. 28, 1835.—Oct. 4, 1838.

9. To Perpignan, Roba, and Lopes Diaz, by Rey, for *a new system of fixed hawsers for ships*, granted Aug. 29, 1834.—Oct. 16, 1838.

10. To Kuhlmann, by Frèdèrie, by Dathis and Ledru, for *mechanical processes of making casks and other similar vessels*, granted Jan. 24, 1828.—Oct. 13, 1838.

11. To Lenglè by Kuhlmann, tho rights he acquired (as in the preceding), May 4, 1838.

12. To Cussac, Baron de, by Vanderméere, le Comte de, 45-100ths for *a carriage called aerial, put in motion without steam or horse-power*, granted Sept. 12, 1838.—Nov. 9, 1838.

13. To Foncier, by Vanderméere, Comte de, 7½-100ths of the above invention, Nov. 9, 1838.

14. To Cussac, Baron de, by Foncier, the 7½-100ths of the above invention, Nov. 9, 1838.

15. To Lefèvre de Birons, by the heirs of the late Terrasson de Fougères, for *mechanical means of manufacturing tiles and bricks*, granted Dec. 3, 1831. —Nov. 13, 1838.

16. To Varaigne, by Halot, for *means of manufacturing and coloring porcelain (en biscuit dégourdi?) enamelled and baked at one heat*, granted June 13, 1838.—Nov. 15, 1838.

17. To Blanchard Brothers, by Guillou, son, for *a new lignéo-dermétique boot and shoe*, granted March 4, 1827.—Nov. 28, 1838.

18. To Granger, by Decan and Co., for *various improvements in mechanical lamps*, granted Feb. 9, 1836.—Nov. 28, 1838.

19 to 30. To Roussel, Gulliard, and Co., and eleven other persons, by Giverne, for *a means of rendering hats completely waterproof*, granted Sept. 15, 1838.—Dec. 5, 1838.

31. To Capouillet, by Pascal, for *making bricks by mechanical means*, granted Feb. 3, 1838.—Dec. 6, 1838.

32. To Capouillet, by Pascal, for *machines for making bricks, tiles, slabs, and artificial stones, plain, or ornamented, sunk or in relief*, granted Nov. 17, 1837.—Dec. 6, 1838.

33. To Cavalier Lions, by Ventouillac, for *a stove for smothering (étouffage) the coccoons of silk worms*, granted Feb. 20, 1833.—Feb. 6, 1838.

34. To Andrée, Baron de, by Roux and Co., for *the composition of a vegeto-mineral bitumen*, granted April 27, 1838.—Dec. 13, 1838.

35. To Champailler, Pearson, Needham, and Co., by Hind, for *an improved machine for manufacturing the tulle called bobinet, either plain or figured*, granted May 27, 1835.—Dec. 26, 1838.

FOREIGN PATENTS.—BELGIUM.

LIST OF PATENTS RECENTLY GRANTED BY THE BELGIAN GOVERNMENT.

(*Continued from No. 55.*)

Etienne Mariotte, faubourg de Flandre, rue Ransfort, No. 165, a patent of invention for 15 years, for *a method of substituting type, made of a cement harder than lead, for metallic type*, May 13, 1840.

Obert, of Ixelles, chaussée d'Etterbeek, No. 152, a patent of invention for 15 years, for *improvements in the construction of iron ships, boats, and other vessels, as well as in the apparatus forming part of these improvements, with means of preventing vessels from foundering, &c.*, July 9, 1840.

Auguste Durand, represented at Brussels by Fremanger, Montagne de la Cour, No. 3, a patent of invention for 15 years, for *an economical hydraulic machine*, July 21, 1840.

Robert Montgomery, represented by Urling, St. Josse ten-Noode, rue des Arts, No. 139, a patent of invention for 10 years, for *improvements in spinning machinery, applicable to mule jennies, and other looms*, July 21, 1840.

John Railton, of Ghent, represented at Brussels by Dixon, a patent of invention for 10 years, for *an improved steam loom, for weaving cotton, flax, silk, and other fibrous substances*, July 21, 1840.

E. Touché Gillès, of Antwerp, Place Verte, No. 704, a patent of invention for 10 years, for *an economical process of manufacturing brown, white, and marbled soap*, July 21, 1840.

François Fourcel, of Bruxelles, represented by Gadon, rue de la Paille, No. 20, a patent of invention for 10 years, for *a new machine for carding cloth*, July 21, 1840.

Guillaume Mariette, of Cheratte (P. of Liege), a patent of improvement for 10 years, to date from May 11, 1840, for *a new improvement on the pistol, called "Pistolet Mariette,"* July 21, 1840.

William Young, of Antwerp, represented by Prisse, Ixelles, rue du Berger, No. 79, a patent of importation for 5 years, for *an improved method of composing printing types*, July 21, 1840.

Augustin Saint, of Paris, address at Brussels, rue de l'Ecuyer, No. 6, a patent of importation for 5 years, for *a new system of percussion for all sorts of fire-arms loaded with cartridge*, July 21, 1840.

P. Kopezynski, rue du Cheval Noir, No. 4, faubourg de Flandres, Brussels, a patent of invention for 15 years, for *a process of disinfecting coal oil, naphtha, schist, and other volatile oils, obtained by distillation of bituminous substances*, July 21, 1840.

Ad. Le Hardy de Beaulieu, of Ixelles, rue du Berger, No. 74, a patent of improvement for 10 years, to date from Aug. 8, 1838, for *improvements in the nail-making machine, for which he obtained a patent Aug. 8, 1839*, July 21, 1840.

François Jacquot, of Brussels, rue de la Braie, No. 3, a patent of importation for 5 years, for *a sector for moking gear and toothed wheels without a pattern*, July 21, 1840.

Abraham Dixon, of Brussels, Hôtel de Groenendael, a patent of importation for 5 years, *for improvements in the boilers and steam-pipes of locomotive and other steam-engines*, July 21, 1840.

Augustin Saint, of Paris, address at Brussels, rue de l'Ecuyer, No. 6, a patent of addition and importation for 5 years, for *improvements in the construction of percussion guns*, July 21, 1840.

Benjamin Fieraert, of Liege, place St. Claire, a patent of invention for 10 years, for *an instrument of veterinary surgery*, Aug. 6, 1840.

Charles Fusnot, of Brussels, rue Christophe, No. 14, a patent of invention for 10 years, for *a new method of making car-rings*, Aug. 6, 1840.

Clement Detry, called Chainque, of Brussels, rue de la Paille, No. 20, a patent of invention for 5 years, for *a new buskin without seam on the instep*, Aug. 6, 1840.

Phœnix Company, of Ghent, a patent of invention for 15 years, for *improvements on looms for spinning flax, cotton, wool, and other fibrous substances*, Aug. 6, 1840.

D. E. Coutaret, and D. A. Roumestan, of Brussels, rue des Douze Apôtres, No. 16, a patent of invention for 15 years, for *a pump with continuous jet, without clapper or valve*, Aug. 6, 1840.

FOREIGN INTELLIGENCE.

FRANCE.

NEEDLE MANUFACTURE IN FRANCE.

A report has been recently made to the Society at Paris, for the Encouragement of the Mechanical Arts, of the manufacture of needles at Merouvel near Aigle. It appears that several attempts have been made to establish the manufacture of needles in France, but until lately without success. The manufactory at Merouvel is the first that was established, and it has had the greatest difficulties to contend with. Two separate companies who undertook to form it, lost 600,000 francs in the attempt, without making any progress. In 1831 the management of the concern was entrusted to M. Vantillard, a common workman, who had been employed in the manufactory. Having had great experience, he avoided the mistakes into which the previous managers had fallen, and by tho discovery of new and economical processes he has raised the establishment at Merouvel from a state of ruin to one of prosperity. The manufactory, which is very large, employs upwards of eighty men, whose average wages are 1 fr. 80 c. per day. The machinery is set in motion by water power. Paris, Lyons, and Marseilles are the principal markets for these needles. The report made to the society on tho quality of the manufacture was very favorable. The needles, it is said, are cut and pierced on a new principle with great regularity; the polish is brilliant, the eye does not cut the thread; tho point is very sharp, and in the axis of the needle, and the temper of the steel is exceedingly good. The prejudice against French needles in France has hitherto been so great, that few would knowingly use them, and it was only by representing them to be of English manufacture that they could be sold. The report to the society says this prejudice has now no foundation. The needles imported into France, annually, are estimated at four millions of francs.

BANKRUPTCIES IN PARIS.

The Bankruptcies in the department of the Seino during August were fewer than in July, and the total amount of the debts less. The Tribunal do Commerce, during the second fortnight of last month, pronounced 31 declarations of Bankruptcy, only one of which was without a balance-sheet. Of the 30 others the assets amounted to 821,218 f., and the debts to 774,393f. This last sum is thus divided:—Seven bankrupts have debts amounting to between 4,000f. and 8,871f.; six, between 10,700f. and 18,000f.; thirteen, between 21,000f. and 39,000f.; and four to between 56,400f. and 87,900f.; so that not one during the last fortnight amounts to 100,000f., an occurrence extremely rare. These 30 bankruptcies, added to 27 declared

during the first fortnight of the same month, make a gross amount of debts of 1,484,360f., divided among 58 bankruptcies. Thirty-two of these bankrupts carried on each a different line of business. Among the remaining 26 there were two merchants, two marchands de nouveautés, two tailors, two booksellers, seven wine-merchants, six traiteurs or restaurateurs, three limonadiers, and two wheelwrights. In July the declared bankruptcies were 73, the amount of whose aggregate debts was 4,026,691f.; and in June the number was 74, and the amount nearly 6,000,000f.

The silk manufactures of Lyons consume annually a million of kilogrammes of silk; or one thousand millions of grammes. The quantity lost in winding it up, may be estimated at least at five per cent, that is to say, at 50,000,000; this makes, therefore, the quantity of silk, including the waste, amount to 1,050,000,000 grammes. Four cocons are required to produce one gramme of silk, therefore the consumption of silk at Lyons amounts to 4,200,000,000. If we estimate the number of silk-worms that must be hatched to produce this number of worms, we must add to the number of 4,200,000,000, first those which die in rearing, those kept to procure eggs for the following year, and those cocons which cannot be wound. The total number of silk-worms hatched to supply the trade of Lyons alone would, with these additions, amount to 4,292,000,000. The length of a thread of silk in each cocon is about 500 metres. The quantity of silk thread would consequently, if extended, reach to a distance of 2,100,000,000 of kilometres; that is, it would extend fourteen times the distance of the sun from the earth; 5,494 times the distance of the moon; and would wind round the world at the equator 52,505 times.

According to an ordinance which has just been issued, all the articles of gold and silver workmanship imported into France, with the exception of foreign clocks and watches, are to be stamped with a foreign mark to distinguish them from those of France.

M. Jourdainc, a young French architect, has been sent by the government to Tunis, for the purpose of erecting on the summit of the mountain of Carthage, on the spot which tradition points out as the tomb of St. Louis, a monument to the memory of that king. This monument is to be a chapel built in the style of the period in which the "Saint" lived.

The French Minister of the Interior has sent a circular to the prefects of the different departments relative to the formation of a general statistical return of beggars and paupers. Three commissioners are appointed for the purpose of collecting facts and making a report.

The Artesian well at the abbattoir of Grenelle has been bored to a depth of nearly 500 metres (equal to 1,700 feet). It appears from some new thermometric observations made by Messrs. Arago and Walferdin, that the heat at the bottom of the well is 26 deg. higher than on the surface. This indicates an increase of nearly one deg. for every twenty metres of depth.

The Minister of Public Works has instituted a central office connected with metallurgy and the working of railways, the direction of which is confided to M. Biueau, engineer in chief of mines. In this capacity M. Bineau is appointed to visit the railroads completed by private companies, and to examine the engines which they employ in conveying the trains.

BELGIUM.

The *Moniteur Belge* contains a report from the Minister of Public Works, in which he declares, that the Academy of Antwerp ought to be organised and placed on a footing corresponding to the wants of art and the progress of learning, and that its different departments should be enlarged and increased. In accordance with this report, a royal decree has been issued, in which the minister is directed to submit to the King a project for the complete reorganisation of the Antwerp Academy, founded on the importance of that establishment, and the wants of the present advanced state of knowledge. Independently of the sum allowed by the town of Antwerp, an annual subsidy of 25,000 frs. from the national funds will be appropriated to the expenses of the Royal Academy and Museum of Antwerp. The recent fêtes in honor of Rubens, it may be supposed, have roused the attention of the government to the neglected state of the academy of the town which boasts of being the birthplace of that great painter.

We learn with pleasure, says the *Fanal*, that after numerous conferences, the negotiation opened for the establishment of a line of steam-ships between Belgium and North America, are satisfactorily arranged. The plan, which reserves a part of the enterprise to be undertaken by the Americans, has been adopted. The contracting parties signed all the necessary agreements last week. Mr. Colden, the American merchant, took an active part in the conclusion of this arrangement. There will be at least ten departures in a year from Antwerp to New York; and as many from New York to Antwerp. Belgian produce will enjoy a drawback of ten per cent. on the price of the freight. "The conclusion of such an arrangement," observes the *Fanal*, "in the present state of things, is a convincing proof of the confidence which foreigners repose in the resources and future prosperity of Belgium." Mr. Colden departed for New York on the 1st inst., and will return to Belgium in the middle of November. Before his departure he made arrangements with some of the principal merchants, for increasing the interchange of the manufactures and produce of the two countries.

RAILWAY INTELLIGENCE,

DOMESTIC AND FOREIGN.

London and Croydon Railway.—The tenth half-yearly meeting of the shareholders of the London and Croydon Railway Company, was held on Tuesday at the Loudon Tavern, W. A. Wilkinson, Esq., in the chair. It appeared from the report that the result of raising the fares, upon one month's trial, had been a falling off in passengers to the extent of 11,413, and of receipts to the amount of only £11 7s. 6d., as compared with the preceding month. There had, however, been a saving in the Government duty of £32 6s. 10¾d., and of toll to the Greenwich Company of £110 13s. 1½d., so that the proprietors of this company had benefited by the decrease of passengers to the extent of £131 12s. 6¼d. in the month, or at the rate of more than £1,500 per annum. The report added, "That in order to accommodate as far as possible that portion of the public which had been deprived of the use of the railway by the higher fares, the directors had determined to put on a third class train between Croydon and New Cross at low fares; the fares by this train would not, however, be reduced between New Cross and London, in consequence of the heavy toll payable to the Greenwich Company." The report was adopted. Some conversation then took place as to the details of traffic on the road, and on other matters, after which the meeting broke up.

Bristol and Exeter Railway.—The cuttings through Puritan-hill, near Bridgewater, are now almost completed, and it is confidently stated that the line from Bridgewater to Bristol, will be opened in April next, when the Bridgewater folks will be able to go there and back in the short space of three hours. The bridge over the Parret is rapidly progressing.

The North Midland and Junction Railways have, in connection with the Birmingham and London lines, determined to establish luggage trains from Monday next, by which means they have driven all the wagons off the roads throughout the line.—*Lincoln Mercury.*

Railway Bills.—The return, in our last number, of railway bills, shows fully the working of the standing orders and monetary pressure. It will be seen that it is only in 1833 that the beginning of the grand system of railway communication is to be traced, and that down to 1837 it extended rapidly. Since that year only three bills have been passed, just one a year, viz., the Edinburgh and Glasgow, Taw Vale, and West Durham, only the first of which is of any importance. The following have been the numbers of bills for new lines and amended lines, in each year:—

	NEW.	AMENDED.
1831	5	4
1832	4	4
1833	5	6
1834	5	9
1835	8	10
1836	29	5
1837	15	27
1838	2	16
1839	1	24
1840	0	22

In this year it will be seen that not one bill has been passed for a new line.

When we come to the number of plans deposited, we find affairs equally unsatisfactory, very few new ones are brought forward, the applications being mostly renewals of old plans. Distributed under these heads the number of plans deposited for each session is as follows:—

	NEW.	RENEWED.	PASSED.
For 1838	55	—	2
1839	11	14	1
1840	20	16	0
1841	34	15	0

This return discloses fully the inconvenience of the system. Previously to 1838 no returns are given of the plans deposited, but still materials enough exist to show the extent of the evil. It appears that the plans have been deposited—

For 5 lines	4 times.
5 —	3 —
22 —	2 —

Comment on this would almost be superfluous: it is evident that the new system does not work well, and that some amendment must be effected, or the progress of the railway system will be totally impeded. The ten per cent. deposit was for the purpose of ensuring the completion of lines for which acts were obtained, although why it was necessary to take any steps for this purpose we do not know, for of fifty acts passed in 1835-6 and 7, not five have fallen to the ground, and those that have not been fully carried out would evidently not have been begun at all had the ten per cent. system been applied to them. The risk of the preliminary expenses is quite enough to induce parties to exert themselves; no penalty or bond more stringent is required.—*Railway Magazine.*

Northern Railway.—The Town Council of Aberdeen have agreed to a memorial, which is thus explained:—The Provost said that the Council were generally aware that, in the course of last summer, some public-spirited individuals in this city, in conjunction with gentlemen resident in Edinburgh, had a survey made by eminent railway engineers, with the view of connecting Aberdeen with Edinburgh and Glasgow, by means of a rail-

road. The country between these cities was examined, levels were taken, and a plan made out, showing the proposed lines (both by Stirling and through Fife), and the railroads connected therewith, already executed, in progress, or projected; and a full report was also prepared, with estimates of the expense of the execution, of the traffic, and of the revenue. The report and estimates were satisfactory to the gentlemen concerned, and he believed that the consideration of the subject would be submitted to the public as soon as the other railways to the south and west of Edinburgh were sufficiently advanced to warrant them in proceeding. His object in calling their attention to this subject, on the present occasion, was to intimate that a Government Commission was now engaged in surveying the best line from Edinburgh to join the London lines, and to interest them in soliciting from Government the aid of the commissioners, in reporting on the most suitable line to be continued northward to this city, in order to prevent the expenditure of large sums of money by the projectors of competing lines. The main line ought not, he conceived, to be made to suit any particular district or locality, but to be formed on the broad principle of general utility. With this view, he thought that the Magistrates and Council should memorialise the Lords of the Treasury, praying them to extend the powers of that commission so as that the survey might be continued northward as far as Aberdeen, and a report furnished on the best line for connecting this city with Edinburgh and Glasgow.—*Inverness Courier.*

Partial Opening of the Greenock and Glasgow Railway.—On Tuesday afternoon, the Glasgow and Greenock Railway was opened from Greenock to Port Glasgow. No public announcement of the opening was given, and as it was only for a short distance, it was the intention of the directors to make it as private as possible, but this had no effect in lessening the turn-out of the inhabitants to witness the first display of a locomotive train in that quarter. Two hours before the time appointed, persons began to assemble at the depot, and on the streets crossed by the railway, and by the time the directors, Provost Fairrie, and several members of the town council, got into the carriages, every approach to the railway was literally crowded. Flags were flying in all directions, and the greatest enthusiasm prevailed amongst the assembled multitude, and the manner in which the train was cheered on its departure, and hailed on its return, shows that a deep interest is felt in the success of the undertaking by all classes of the community. The whole affair passed over without the slightest accident, and we understand this part of the line will be available to the public without delay. —*Glasgow Chronicle.*

Extraordinary Railway Train.—Notwithstanding the answer given by the chairman of the North Midland Railway Company, to the question put at the half yearly meeting on Wednesday in last week, as to whether any inducement had been held out by the directors to encourage Sunday travelling, there was an immense train of passengers despatched from Leeds to Sheffield, at reduced fares, on Sunday morning. We understand that before the annual meeting, it had been agreed with the heads of three or four large firms in the town to place at their disposal a number of tickets which, for the small charge of 3s., should guarantee the conveyance of a person from Leeds to Sheffield and back on the Sunday. These tickets were 2,400 in number, and they had nearly all been sold when the half-yearly meeting took place. Of course the parties attended at the station on Sunday morning, and some of them threatened to pull down the station-house if they were not sent on according to contract. The vast number of persons occasioned considerable delay in the starting of the train; 8 o'clock was the hour appointed, but they did not get off till full half-past 9. The train consisted of 63 carriages, which were drawn by four engines. It reached Sheffield about 12 o'clock, and started on its return about a quarter before 7. On account of the approaching darkness, and an additional number of carriages having been appended, the progress of the train on its return was not so rapid; and on its arrival near the Woodlesford station, about five miles from Leeds, it was detained nearly an hour, on account of the want of water in the engines. In order to procure a supply, they were obliged to leave the passenger carriages and come to Leeds, and then return to bring them forward. This delayed the arrival of the trains at Leeds till nearly 11 o'clock. We are happy, however, to say that the day passed over without accident. Before the train started in the morning, one person was robbed of his watch whilst standing in the booking-office of the station. We copy from the *Sheffield Iris* the following account of the visit to that town.—"The morning train consisted of 63 carriages driven by four engines, and the back train had ten additional carriages and an additional engine. Throughout the whole day, but particularly about the time of the arrival and departure of the colossal train, the Wicker was very much crowded both by the travellers, as well as townspeople, who went from curiosity. Some of the innkeepers, awake to the demand for substantials which such an influx of hungry visitors would cause, had provided dinner at their houses for as many as they could accommodate comfortably, and had their servants in attendance at the station with cards intimating the same, and their prudent arrangements were duly appreciated. From 5 to 6 o'clock, the immense current of people proceeding in the direction of the Wicker, and beyond there to places contiguous to the line, had a most stirring and extraordinary appearance. Every street on the way poured in, during that time, its constant stream of pedestrians. After waiting about an hour and a half, anxiously, for the onward movement of the steamers, experiencing very much the same kind of feeling as the good people of this town have frequently done on announced balloon ascents, at length the train did start in good earnest at 20 minutes to 7, and such a sight was then presented as must have astonished and gratified every sight-seer. First proceeded the five engines, not heralded by "musical cheers," but apparently striving to outdo each other in horrid screams. Then followed the 73 carriages, containing a living and moving mass of apparently happy human beings. Cheers were given by them as they passed on. The train could not be less than half a mile in extent, and, as seen from the bend of the road in Brightside-lane, had the appearance of a magnificent bow encircling the landscape. At this place, a number of carriages from Sheffield took their station. The concourse of people must have amounted to many thousands; all seemed pleased with the sight, and the conduct of the crowd was, as far as we observed, exceedingly good and orderly. We have not heard of a single accident occurring during the whole day, and we are not aware that the morals of the people have been in any way injured by so many enjoying the rich treat and the fresh air which are to be met with on the North Midland Railway. We understand a return trip will take place from Sheffield to Leeds probably next Monday, but if not then, on that day fortnight, in consequence of Doncaster races falling on the intervening Monday, when, we doubt not, the train on that occasion will be equally magnificent. We should have been glad to see our neighbors from Leeds yesterday instead of Sunday, but we are informed there was no alternative but either to choose Sunday or shut up all the mills on Monday, which latter step would have thrown thousands out of employment, who could not afford to lose that day. The case is different at Sheffield, consequently a Monday is fixed upon."—*Leeds Intelligencer.*

Another Accident on the Blackwall Railway. —About five o'clock on Tuesday evening last, an accident occurred on the above railway, which severely injured one man, and placed the lives of many other persons in the greatest jeopardy. The down train left the station in the Minories about the hour above named, and had not proceeded far before the rope which draws the train suddenly broke, and the carriages, which were going at the time at the rate of almost 30 miles an hour, received so violent a jerk as to be all nearly thrown off the line. A man named James Hill, a carpenter on the railway, who was riding in one of the second class carriages, was thrown out with such violence that he was taken up quite senseless, and on being conveyed to the London Hospital, Mile-end-road, it was ascertained that the injuries he had received on his head and body were so great, that not even the slightest hopes of his recovery are entertained.—*Times*, of Thursday. [We are authorised to contradict a paragraph which appeared in our journal of yesterday, stating that, owing to the breaking of the rope, a passenger had been thrown out, and seriously injured. The only accident that did occur was to a workman in the engine-room, who, owing to the slipping of a swivel, was severely struck; but is now out of danger.—*Times*, of yesterday.]

More Railway Accidents.—On Tuesday morning, when the half-past 10 o'clock down train had nearly reached the Eckington station, the engine was thrown off the rails in consequence of some workmen having placed a crane upon the line. When this was perceived by the engine driver and guard, they did every thing in their power to arrest the speed of the train, but, notwithstanding all their efforts, the engine and several of the carriages were turned off the rails, and had not the concussion broken some of the pipes and let off the steam, it is to be feared the engine would have dragged several of the carriages over, and endangered the lives of many of the passengers. As it was, considerable damage to the engine and to a few of the carriages, and a delay of about two hours and a half, were fortunately all the mischief that occurred. We understand that the workmen who placed the crane on the line, had done it in direct opposition to the commands of their employers. On Friday morning, between 3 and 4 o'clock, another serious accident occurred to a luggage train proceeding southward about three miles from Masborough, in consequence of the neglect of the workmen in unfortunately not having turned the points of a temporary line laid for some purpose in Mr. Buxton's contract. The luggage train in question was drawn by two engines, the first of which, from the cause just mentioned, getting upon the wrong line, by its own weight turned the points as they ought to have stood on its approach. Thus one engine being on one line of rails, and the other upon the other, there was immediately a dreadful smash, both with the engines themselves and the loaded trucks, which were thrown one upon another, and the goods, cutlery, plate, spectacle glasses, &c., scattered around in all directions. One of the stokers, we hear, had his collar-bone broken and his arm nearly cut off, and an engineer was much hurt about the face. When the mail train, which passes Chesterfield about 4 o'clock, arrived at the place, the road being obstructed, it returned to Derby for assistance, whence two engines and a number of workmen were immediately despatched; by which means the road was soon cleared, so as to be again passable.—*Derby Chronicle.*

Hull and Selby Railway.—Another Serious Accident.—On Monday, an accident of a very serious nature occurred on the Hull and Selby Railway, in the depôt at this town, on the arrival of the Leeds and York half-past 5 o'clock train. The circumstances of this accident, as related to us by an eye-witness, were as follow:—On the arrival of the train at the gates opposite to the end of Manor-house-street, the engine, as is usual, was detached from the carriages, and proceeded at a quick rate to that part of the line where the pointers are, and where the rails branch off on each side, when it was turned on to the northernmost line. The train, which was almost immediately after the engine, was, by means of the pointers, turned on to the second line running parallel with, and on the south side of, the line upon which the engine

had gone. As soon as the train had got upon the second line, it was evident that the impetus which had been given to its speed, prior to the engine being detached, was much too great, and that, unless it was immediately stopped, it would go with great force against the partition wall at the end of the depôt. The guard, who was in one of the carriages, having no power to stop the train, it accordingly dashed with great violence against the wall, the first carriage passing completely through, as far as the passage on one side of which the waiting-offices are situate. The only serious injuries which have been received from this concussion, are those of three men, viz., the guard of the train, a fireman, and a passenger named Morgan. The injuries of the guard were principally confined to the knee, which, from the violence of the shock, broke through the buffer of the carriage upon which he was seated. Taylor's thigh was broken in a serious manner, and three of the fingers were taken off the right hand of the other person, Morgan. Some other passengers in the train were also slightly bruised, by being thrown from one side of the carriage to the other, from the violence with which the train came in contact with the wall. The first carriage was shattered to pieces, and some of the others broken, though not so as to be unserviceable. There can be no doubt that, had the guard possessed the power of checking the speed of the train by means of what are called "breaks" (which are generally attached to railway carriages, and subject to the control of the guard), this accident would not have occurred. [We learn this morning, that the three persons above stated to be seriously injured are now out of danger, and in as fair a way of recovery as can be expected. We also are informed that there can be no censure applied to the guard, as there were no "breaks" on any of the carriages in the train.]—*Hull Observer* of Tuesday.

The Late Railway Accidents.—The following letter, which deserves especial attention, appeared in the '*Times*' of Thursday:—

"*To the Editor.*—Sir,—It is with great satisfaction I perceive, that in your paper of yesterday you have taken up the subject of the late dreadful railroad accidents, as calling for a fuller and more deliberate examination of the whole system, than is afforded by a mere temporary inquisition into the consequences which the thoughtlessness characteristic of the mass of a population, and the desire of the railway directors to make the best of circumstances undeniably and lamentably irremediable, would otherwise consign to oblivion.

"So little have such examples the practical effect of deterring the public, that I understand large numbers of people went down by the same railway on the days immediately subsequent to the accident, merely to satisfy their curiosity by seeing the spot.

"As, therefore, it is evident that the mass of the population either will not, or cannot properly attend to their own safety, it becomes the duty of Government to extend its paternal protection in this particular over these inconsiderate children of the state.

"I would not occupy your attention if I had no practical remedy to propose; but I have long observed, with much disapprobation, that the embankments along which the railways run for considerable distances, and often at great elevations, are almost universally unprovided with any lateral means of protection, in case of—what may at any time happen—the engine getting off the rails.

"In case, therefore, that accidents should happen at those spots, as the bank descends in an abrupt declivity almost close to the rails, there is scarcely any possibility of the escape of the train from rushing down the precipice at its previously attained velocity, which is the accident that did happen on the late occasion, and of which we have all deplored the lamentable consequences.

"The remedy I have now to propose, is very simple, and would, I feel convinced, answer the purpose. It is, that the sides of the embankment should be widened sufficiently to carry a bank of earth, of three or four feet high, and of a thickness capable of resisting a considerable impetus, probably from 6 to 12 feet. Were such a protection in existence in a case where an engine should get off the rail, it appears to me that, impinging on this line of bank, as it probably would, at quite an acute angle, the engine would by reason of its own weight drive its forewheels into the mass of earth without rising over it, and so get clogged and entangled in this impeding material before any serious injury was done; and, even if a bank were exposed broadside to the power, I doubt if a railroad engine, at the highest velocity, could be forced through a consolidated bank of earth 4 feet high, and 12 thick at the base—an experiment that might be easily made, under authority, on any unfinished railroad, and would, as it seems to me, be worth the trial.

"The ground on which I place so much dependence on the resistance of this kind of material, is from the well-known fact, that it is the one best fitted to resist a bombshell, which of course acts at a much higher velocity.

"To show that there is no impracticability in the means I suggest, I would instance, that the Manchester and Liverpool Railway was being furnished with this protection along the embankment, a year ago, and is probably so completed by this time, though I think the bank should have a wider base than is there given to it.

"Many objections as to expense would, of course, be made by railway directors and proprietors to this or indeed any plan of providing against the deficiency I have adverted to, but as I take all such considerations to be totally inferior to that of the safety of the public, I pass them over without trespassing further on your attention, which I fear I have already too long occupied.

"I am, Sir, your obedient humble servant,

Sept. 3. C. D. G."

Railroads in France.—The number of passengers by the railroads from Paris, during the month just expired, amounted, to and from Versailles, to 149,973 persons; St. Cloud, Sevres, Courbevoie, &c., 66,872; and St. Germain, Nanterre, &c., 145,060, making, in the aggregate, 361,910. During the month, the receipts by the St. Cloud and Versailles road amounted to 243,934f., and by that to St. Germain, 149,040f. "It is but a few years since," observes the *Moniteur Parisien*, "the whole receipts from passengers by ordinary conveyances to and from Versailles and St. Germain, produced less in twelve months than the above sum realised in one month."

RAILROADS IN HOLLAND.

The Brussels paper, the *Emancipation*, has a long article for the purpose of showing that railroads are not adapted to, nor are wanted in all countries; and that Holland is one of those kingdoms so peculiarly circumstanced, as not to render it advisable to introduce the communication by railways there. There is something curious in the reasoning, and some novelty in the facts stated, which make it worth attention.—

"There are periods when all people adopt the same ideas, and seem to constrain themselves to the same wants, and to pursue the same labors. Sometimes, there does exist a necessity for all nations to do this, but we cannot persuade ourselves that it must be so in all cases. The adoption of fire-arms, for instance, by one nation, imperiously obliged all others to employ the same arms. But in questions of civilisation, in the development, for instance, of the internal communications of a country, to the same manner as in a neighboring state, ought we to take exactly the same means, and, in all circumstances, to follow the same steps? The object to be looked at is the end to be obtained, and provided it be accomplished, by whatever means, all the requisite success is gained. Thus, we conceive, that Holland, if furnished with rapid boats on her magnificent canals, would be placed, as regards her internal communication, in a much better condition than by the lines of railway which have been laid down. We are aware that in the opinion of many, the country which does not lay down railways allows other nations to pass it in the great movement of civilisation, and remains behind all other countries. England and the United States commenced this new mode of communication; Belgium holds the third rank; France, the whole of Germany, Russia, Holland, have been anxious to follow in their track. A country destitute of railroads would appear, to many persons, to be half a century behind all others.

"We must not, however, be deceived by this delusion. The point to be attended to, is not so much to make our roads like those of our neighbors and competitors, as to endeavor to increase the business of the country. When the latter result is not obtained, we may, it is true, by making railroads, give a country the appearance of activity; but it will be only in appearance, and will have no reality. A railway is nothing more than a road more level than a common road, on which carriages can run with less friction. As to the steam-engine, that can be employed on common roads, or on canals; in each case it has the same power, but its force is variously diminished, according to the obstructions it meets with on the road. On the straight level roads of Holland, why have they not attempted to propel trains of carriages without having rails? Those roads, paved with small bricks and covered over with a slight layer of fine sand, would be eminently adapted for that kind of locomotion. On the other hand, the canals which intersect the interior of Holland, present a most advantageous means of communication by quick passage boats.

The railroad from Amsterdam to Haarlem is the only one in Holland that is completely finished, and in operation. This road is laid down for the greater part of its course along the side of the canal from Haarlem to Amsterdam; and it passes across the mouth of the great lake of Haarlem. The ground on which the rails are laid, is a fine sand, loosened and softened by the waters which cover it in all parts. It would have been impossible in many places to fix the rails on this uncertain foundation, and piles were obliged to be driven in for the purpose of gaining a solid support. This necessarily added much to the expense. It had been supposed that, on the flat plains of Holland, nothing could have been more easy or less expensive than the formation of a railway; but, owing to the nature of the ground, which is not solid enough to support the rails, the very opposite of this has been the case.

"The distance from Amsterdam to Haarlem is only two leagues and a half, therefore this railroad in its present state is of no importance. It has not even driven the diligences off the road between those two towns. The time occupied in performing the distance by the railroad, is about twenty minutes. This speed is less than that attained on the Belgian railroads, though there are no intermediate stations. The locomotives employed are, nevertheless, very well constructed, and seem as powerful as those in our country. Besides, the coke used, is made from the best English coals. We cannot, therefore, at first perceive the reason why these trains, which consist of only eight or ten carriages, do not attain a greater speed. It appears, too, that the engineers have instructions to go faster if they can.

"This defect is, perhaps, partly owing to the size of the carriages. The distance of the rails apart, is much wider than on the Belgian and the greater

part of the English railroads. It is evident that the consequently increased size of the coaches must considerably increase the resistance of the air to the progress of the trains.*

"The railway from Amsterdam to Haarlem is a single line throughout. It is even too narrow for the width of the coaches, for in many places the coach-doors are only a few inches distant from the walls, or palisades, which fence the road. This shows the necessity of the notice that is fixed in all the carriages: "It is dangerous to put your head or hands out of the coach windows."

"The railroad from Amsterdam to Haarlem appears on the whole to be without grandeur, without activity, and without life. Can this be considered a proof that railroads are not wanted in Holland? We dare not, at present, positively affirm that proposition, because, before any determined judgment can be formed from these effects, it will be necessary to see the whole connecting links of the chain of communication completed. What would make it appear, however, that railroads will not be of great use in Holland, is the fact that it required three years to form the company for making the railroad from Amsterdam to Haarlem, and to commence the first works. The Dutch capitalists, who generally judge with great correctness as to the probable success of the undertakings proposed to them, have for a long time hesitated to give their support to the rising enterprise. The government itself has not made many efforts to forward their execution. Nevertheless, new lines are now in preparation. The railway company from Amsterdam to Haarlem has recently obtained authority to prolong it to Leyden; and it is intended to be carried still further, to Rotterdam. On the other direction, a line of railway will be laid down to Utrecht, and will be extended to Arnheim. The whole railway system of Holland may then be represented by the letter V, the point of which will be Amsterdam, and the two extremities Rotterdam and Arnheim or Nymeguen. The Zuydersee will thus be placed within a few hours distance of the Meuse and the Waal, the two great arteries of Holland. When these communications are completed, we shall then be able to see whether railways are really wanted in Holland, or not, or whether the communication by the canal, for which it presents such great advantages, does not, when properly rendered available, supersede the necessity of railroads in that country."

* The carriages on the Great Western railway refute this opinion. Their size is much greater than on the London and Birmingham railroad, and yet the speed they attain is fully as great.

RAILROADS IN GERMANY.

The Commissioners of the Grand Duke of Saxe Weimar, and of the Dukes of Saxe Meiningen and of Saxe Coburg Gotha, who were appointed to prepare plans for two great lines of railroad through their dominions, have completed their labors, and have signed a treaty by which their sovereigns bind themselves to the following engagements. 1st. To construct at the cost of their respective states, or to cause to be constructed by individual enterprise, two railroads which shall traverse Thuringia; one from north to south, the other from east to west. 2d. To pass in their respective states a law of expropriation, to facilitate and hasten the completion of those railways. 3d. To commence negotiations with the states bordering on their territories for the purpose of inducing them to continue and prolong those railroads. As Thuringia is in the heart of Germany, the establishment of these railroads, projected by the three Saxon Duchies, is of the greatest importance, because they will serve as connecting links of the numerous railways which are either already finished, or are in the course of construction, to the four cardinal points of Germany; so that there is every reason to believe that the wish expressed by all the German political economists, of seeing the territory of the German Confederation covered with a net-work of railways, will not be long before it is realised.

According to the accounts received from Nuremburgh in Bavaria, the canal for making a communication between the Rhine and the Danube is proceeding with great activity. The realisation of the conceptions of Charlemagne and Napoleon of the junction of the Rhine and the Danube, will be one of the most glorious achievements of the age.

GRATUITOUS COPIES

of our Journal have been forwarded to a number of Individuals interested in some Patent, or Invention, of which notice has been taken in our number of to-day.

TO CORRESPONDENTS.

We shall, at all times, be ready to ANSWER QUESTIONS *that may be put to us, relative to any of the subjects indicated in our title; and questions put during the current week, will be replied to either the same, or following week.*

"THE INVENTORS' ADVOCATE, *and* JOURNAL OF INDUSTRY," *may be forwarded,* postage-free, *to all the undermentioned places:—*

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For the convenience of persons residing in REMOTE PLACES, *the* "INVENTORS' ADVOCATE," *will be regularly issued in* MONTHLY PARTS, *stitched in a handsome wrapper.* PARTS 1 *to* 14, ARE NOW READY.

ADVERTISEMENTS *should be sent in not later than* Thursday Evening.

"Charles Young."—*Our Correspondent is in error; as he will find by perusing our* 13*th number.*

'E. Richards."—*Will our Correspondent oblige us with a personal interview, or say where we can address him privately?*

"Mr. Thomas Craddock, Broadheath, Presteign."—*We have written to this gentleman several times, by his desire, but our letters are on every occasion returned by the Post office authorities,—written on—*"Try Exeter," "Try Honiton," "Unknown," &c., &c. *That there is such a place as* Broadheath, Presteign, *we feel fully persuaded. We believe it is in Wales; but surely the Post-office ought to be able to tell. Our Correspondent would never date from his place of residence, and give it a wrong name.*

The description of Mr. Deplanque's valuable invention *reached us too late for insertion in the present number. It shall appear in our next.*

TO OUR SUBSCRIBERS.

TWO *numbers of the* "INVENTORS' ADVOCATE" *(Nos.* 48 *and* 49*) were published* July 4. *The former contains, in addition to the usual varied matter, the* TITLE PAGE *and a* COPIOUS INDEX *to the* SECOND VOLUME.

VOLUME II. *of the* "INVENTORS' ADVOCATE," *handsomely bound, is* NOW READY. *A* FEW COPIES *of the* FIRST VOLUME *still remain on hand.*

TO INVENTORS.

ALL PERSONS who may be desirous of TAKING OUT PATENTS, or of bringing VALUABLE INVENTIONS into USE, are requested to APPLY to the PROPRIETORS of "THE INVENTORS' ADVOCATE," (DELIANSON CLARK & CO.) at their "PATENT AGENCY OFFICE FOR ALL COUNTRIES," 39, CHANCERY LANE, where they may be consulted, daily, relative to the PATENT LAWS of GREAT BRITAIN, and ALL OTHER STATES.—(See ADVERTISEMENT on the last page of the present Number.)

THE

INVENTORS' ADVOCATE,

AND

JOURNAL OF INDUSTRY.

SATURDAY, SEPT. 12, 1840.

It would be difficult, perhaps, from the mass of iniquity which is perpetrated under the sanction of the laws, to point out the particular law which affords the pretext for the greatest amount of injustice. We may safely assert, however, that there are few whose claims to pre-eminence exceed those of the laws relating to bankrupts and insolvent debtors. The principle of their operation is to punish the honest man for the delinquencies of the knave, for the latter passes through the process of "relief" no worse in reputation, with a reserve secret fund to recommence his operations; the former comes out of prison damaged in character, his prospects blighted, and without any money to enable him to begin the world anew.

We are glad to find that there is now some prospect of remedy being applied for this evil. The Commissioners appointed to inquire into the Laws of Bankruptcy and Insolvency have made their report, which has just been printed. They have proposed numerous reforms in the existing system, well calculated, as far as they go, to effect a most beneficial change in the administration of those laws. The defects in the insolvent law, as pointed out by the Commissioners in their report, are even greater than those of the laws relating to bankrupts.

The prominent defects noticed are, that they award punishment to misfortune, and give no relief to the honest debtor without imprisonment; that they afford very inefficient means for the discovery and seizure of property; that they provide very inadequate punishment for frauds when detected; that they afford facilities to the fraudulent debtor to escape detection and punishment; that they give the detaining creditor power to release the debtor, though remanded to prison for fraud; and that they make all future property indiscriminately liable.

The Commissioners, after wading through and examining the different stages of a bankrupt's progress through the courts, and suggesting improvements in almost every one, conclude by recommending the establishment of an entirely new court for the administration of the estates of bankrupts and insolvent debtors. The general principles on which their recommendations are founded, are,—that the same laws should apply to small as well as to large debtors; that greater facility should be given to the honest debtor to declare himself insolvent, and give up his property for the disposal of his creditors, whilst greater power should be given to the creditor to compel a debtor to become a bankrupt; that future property should not be liable to former debts, except in certain cases; that greater facilities be given for the punishment of fraudulent debtors; and that arrest on final process, as well as on mesne process, should be abolished, except for the prevention of escape or fraud. These being the main principles, it is proposed to carry them into effect by a court in which the jurisdiction of bankruptcy and insolvency would be united; the court to be presided over by judges especially appointed for the purpose. The number of judges estimated to be necessary for discharging the duties of the new court, throughout England and Wales, is twenty-two or twenty-three; and the whole host of existing commissioners, to the amount of seven hundred, is to be disbanded.

The reforms proposed by the report of the commissioners are searching, as far as they go, and will, no doubt, if carried into effect, be productive of much good. But we yet see too much of the mechanism of the law about their best efforts, and too little regard for saving expense and trouble to the public in the recommendations they propose.

These nibblings of law reform ought indeed to be thankfully taken as "instalments;" but they should only be viewed as instalments, of the great, comprehensive, and enlightened reforms of the law, which, sooner or later, the people of this country will be roused to demand,—reforms, not clogged with technicalities, and cramped by precedents, but founded on the basis of justice and common sense alone, and adapted for the guidance of an intelligent and free people.

PRESSURE REGULATED BY TIME.

By following the course of reasoning which we pursued last week, and in a preceding number, respecting velocity, power, and resistance, we are enabled to arrive at some important theoretical and practical conclusions. The principle we endeavored to establish, viz., that *time* forms an essential element in the estimate of the amount of the power of resistance, as well as of motion, will also apply with equal truth to pressures. This, indeed, may almost be considered as self-evident, for resistance offered to the progress of a body, is nothing more than an opposing, or reacting, pressure; the two forces are, in fact, the same, though acting in different manners.

It is an admitted principle in mechanical science, that the same theorems which regulate motions, regulate also pressures; pressure being only motion resisted. Now, if we take this law for our guide, we shall be readily able to establish that the amount of pressure, as well as of resistance and motion, has a reference to the *times of action*, even though, as in the case of most pressures, there is no motion to indicate the time. For instance, taking for granted that the same laws regulate pressures which regulate motions, we must, as a necessary consequence, infer that time, which constitutes so important a consideration in the estimate of a moving power, must also enter into consideration in estimating the amount of pressures.

Though this is a conclusion from which those who admit the premises cannot reasonably dissent, yet we are not aware that pressure has hitherto been considered in this manner in its relation to time; as it appears to us it ought most decidedly to be. It is from not considering it in this relation, that many common phenomena in mechanical science have been either not explained, or have been explained unsatisfactorily. We confess that there are some strong prejudices to be overcome against this view of the subject, arising from the different effects produced by motions and pressures, but when these effects are considered in connection with the laws of resistance, and the times of action, as explained in our previous articles, all difficulty, we trust, will be removed.

We contend, for example, that a weight resting on a table, must have the same tendency to motion, and exert the same force in a given time, as if it were unsupported, and were to strike the table with its accumulated power, after falling during the same interval. This is putting the case in its strongest point, and is, we admit, on the face of it, directly opposed to fact and experience; for we all know that a weight falling from a height, produces much more effect on the body against which it strikes, than if it were to be resting on the same body during the time of the fall; and yet, if we do not allow that the force in the two cases is equal, we contradict the generally admitted principle, that pressures and motions are the same, and obey the same laws.

In order to explain this more fully, let us return to the consideration of the action of gravitation. This force has a direct and constant relation to the time in which it acts. Near the surface of the earth, it communicates a velocity of thirty-two feet in a second to a body, after falling during the same time; the average velocity being sixteen feet in a second. Now, were the attraction of gravitation to give a greater or a less velocity than this, the amount of force itself must be changed, and be greater or less in proportion. Suppose, for instance, that the attraction were to communicate a double velocity in the same space of time; to produce that effect, the force must be doubled, and a body, which before weighed one pound, would, with the doubled attraction, weigh two pounds.

As the action of gravitation is the same on a body at rest, as when it is unsupported and falling, we must conclude that a body resting on any support is attracted towards the earth with a force equal to communicate a velocity of sixteen feet in a second. The action of the attracting force on a weight resting on a table, is, however, spread over each instant of time, to its minutest division, and no apparent effect is produced. When the same weight strikes against the table, after falling for one second, all the accumulated power which it has gained during the fall is brought to act at once. The whole effort of the attraction of gravitation, which has been acting on the falling weight without resistance for one second, is thus concentrated in a single blow, whilst, in the former case, there is no accu-

mulation of power, because the reaction of the support overcomes the force of gravitation as quickly as it is exerted.

In looking for the cause of the great difference between the effects which these different manifestations of the same amount of power produce, we must bear in mind, that resistance has its times of action as well as motions and pressures, and that a body moving with double velocity will penetrate a yielding mass to four times the depth, not because the power is more than double, but because the resistance to its progress is comparatively diminished. For, as a resisting force only exerts a certain power in a given time, the same resistance will be offered to the penetration of a ball into a yielding mass, whether it penetrate one inch or twenty inches, provided the different velocities with which it is propelled carry it through the two depths in the same space of time. The difference between the latter case, and the effects of pressure and motion consists only in the circumstance of the resistance offered by the support being too great to be overcome by the resting weight, when it acts without accumulated power; or, in other words, the attraction of gravitation on the weight is not sufficient to overcome *the times of resistance* of the support, so as to make any impression. The power exerted, however, is the same in both cases; the difference in their effects depends on the different modes in which the same power is brought to act.

This consideration of the nature of pressure and its times of action leads to the satisfactory explanation of many phenomena that have been involved in obscurity. Among others, it points out the cause why the friction of wheel carriages is less, in relation to the space traversed, when the velocity is increased; and why a body rolling rapidly does not press so heavily as one moving more slowly. We shall allude to the practical illustrations of the principle in a subsequent number.

NEW INVENTIONS.

NEW AIR MACHINE.

We noticed in our last, that an improved air machine had been invented by M. Franchot, which he anticipated would supersede the use of steam. No description was then given of the mode of its action, further than that it depended on a mode of heating and cooling air or gas, and that the consequent expansion and contraction of the air was made the moving power. A further account of this machine is given in the *Moniteur Industriel*, but we do not find it throws much more light on the construction of the machinery. Like most other descriptions of new inventions, which the French journals supply, it is a mere sketch; from which, without having the apparatus before us, it is next to impossible to form an intelligible account. We shall give the description of it, however, such as the *Moniteur* affords, premising at the same time, that it does not appear to have been submitted to actual experiment.

M. Franchot has submitted his machine to the Academy of Sciences, which has appointed Messrs. Savary, Poncelet, Coriolis, Pouillet, and Seguier, to examine it and report on its merits. M. Franchot says, My air machine has the following advantages. First, to effect rapid changes of temperature in the same mass of air, or any kind of gas in a closed vessel. Secondly, to render available as a moving power the alternate expansions and contractions of that mass of air.

"We can economically effect rapid and complete changes of temperature in the gaseous fluid, by making it pass successively from a hot to a cold chamber, and *vice versa*, by a tube, the surfaces of which are increased in proportion to the quantity of gas employed. The effect of this process is, that the hot air after its expansion in the hot chamber, deposits its heat successively as a reserve power, in the tube which conveys it to the cold chamber; and after being there contracted by means of its cooling and by the action of the machine, it resumes in a great measure, on its return to the hot chamber, the caloric which it had deposited in the intermediate tube. This process of depositing and resuming the heat, which affords great advantages, which can be readily made available, cannot be effected in steam-engines. Therefore the steam is permitted to escape, either in the air or in the condensers, though it contains a quantity of heat that ought to be employed. It is evident that in my process, the greatest quantity of heat communicated in the first instance to the air, will be employed with the greatest advantage. The difference which exists between the temperature of the gas during its expansion, and the same gas in its contracted state, must also be borne in mind; and that for the same expenditure of combustibles, the dynamic effect produced is greater in proportion to the extent of that difference; that is to say, in proportion that we can convey the heat of the fire by means of the gas to the refrigerator. It is this principle which M. S. Carrol has demonstrated in a small treatise, entitled Reflections on the Motive Power of Fire, in which the author shows that the moving power of heat exists independently of the agents, whether gas or steam, which are employed to develop it."

MEN OF WAR'S PUMPS.

There has lately taken place at Woolwich, a series of experiments, for the purpose of testing the comparative efficacy and general advantages to a ship, of the common old fashioned pump, Massey's pump and Dawnton's pump, the latter two being patent machines. The result is interesting, though partial and conflicting; but at least it affords one general and comfortable inference—namely, that a ship which has a small crew and an old-fashioned pump will do as well with it, if not better, than a complicated modern pump, which is always much heavier and more expensive than the former. In the course of the comparison, it appeared that Massey's pump, worked with one hand, will fill a cistern of water in one-fourth of the time that would be required by a common pump with the same power. But then Massey's pump costs £120, while a common one costs but £10, and three of those would do more work than one of Massey's, besides being in the aggregate lighter, less cumbersome on deck, and infinitely more easy to be repaired. Each of the many newly patented pumps has some prominent advantage, which is found to be inseparable from drawbacks, especially those of weight, complication, and expense. Dawnton's pump works very well; but sailors say that it easily gets out of order, and then they have great difficulty in setting it right. It is true that one of those of seven inches diameter will do as much as two common hand pumps and a force-pump; but then it will cost £200, besides the prospective expense of repairs; whereas the latter three, which would equal it in work done, would together cost but between £30 and £40; and while the common pump weighs only one hundred and a half, Dawnton's weighs on the average three quarters of a ton. This excess of weight is an important consideration. These facts show that the old pump, after all, is not a bad one.

INTERESTING EXPERIMENTS AT THE MOUTH OF THE TEES.

For some time past, a number of humane individuals have had their attention fixed on the means of affording succour to mariners who may have the misfortune to be cast ashore near the now much-frequented mouth of the Tees; the life-boats of Seaton, Redcar, and Hartlepool, have been put into complete repair, and it has been thought most desirable, if the requisite funds could be raised, to establish posts on various points of the shore, where apparatus should be kept for effecting a ready communication with ships in distress, either under such circumstances as to be unapproachable even by the life-boat, or in situations where the delay attendant on bringing up the life-boat might prove fatal.

Tuesday last was the day appointed for making a fair trial of the respective merits of Captain Manby's apparatus, and Mr. Carte's and Mr. Dennett's rockets. Seaton Carew was the place selected for the experiments, and thither flocked "the whole country-side," to witness a spectacle of so much interest and novelty. Carriages of almost every description, laden with holiday-folk, came rattling through the village in scores, and no fewer than six large and handsome towing-boats were employed on the Tees. The weather was, on the whole, very favorable, a slight shower or two being hardly sufficient to damp the ardour of a multitude predetermined to have a day's rational pleasure.

The first series of experiments was made upon the moor, on which three masts were set up in line, 50 feet apart, and at the distance of 300 yards from the spot where Captain Manby's mortar and the rocket apparatus were placed, each hundred yards being marked by a flag placed in a line with the centre mast of the three above named. The object sought to be obtained was to throw a slender rope the whole distance of 300 yards, and within the masts. The first attempt was made with the mortar, which is of 5½ inches bore, and capable of throwing a 24-pound ball. A ring projecting from the ball receives a sort of short rope made of twisted thongs of buffalo hide, to which an inch-and-a-half line was attached. The ball fell 61 yards short of the distance, and 16 yards to the right of the line of flags. Mr. Carte next tried a Congreve rocket, weighing 12 lbs., to the stick of which a line considerably more slender than Captain Manby's was attached. It was discharged, at an angle of 30 degrees, from a spout fixed by a swivel on a sort of telescope stand, and flew 24 yards beyond the masts, and 35 yards to the right of the line of flags. Mr. Dennett then discharged one of his rockets, weighing nine pounds, and carrying a line somewhat stouter than that used by Mr. Carte. It fell 17 yards beyond the masts, and 57 on the right of the centre line. Captain Manby's second ball was 43 yards short of the distance, and nearly four yards to the right of the centre line. The line of Mr. Carte's second rocket broke, and away flew the ambitious projectile to the distance of about 1,200 yards. Mr. Dennett's second attempt was rather more successful than his first, the rocket alighting 25 yards beyond the distance, and 41 yards to the right of the centre line. A third ball from the mortar fell 36 yards short of the distance, and 10 yards to the right of the centre line. This finished the experiments on the moor, and the party returned to the village.

Opposite the hotel, and about 200 yards from shore, the Sunbeam steamer lay moored, as the ob-

ject to be communicated with. On this occasion, the mortar was not brought into play. Mr. Carte's first rocket broke the line, which had accidentally got entangled with something on the beach; his second line fell right amid-ships of the Sunbeam; and his third, over her bowsprit. Mr. Dennett's first line fell about a boat's length astern of the steamer, his second over her bowsprit, and his third against her funnel. A fourth was discharged without a line, and excited much astonishment by the extent of its range. Mr. Carte then took his apparatus into a boat, and threw a line within a yard of a coble placed at a considerable distance. The same gentleman also exhibited his "life-preserver,"—a ring of cork, of considerable thickness, enclosed in a waterproof covering, and of sufficient diameter to allow a person to put his head and shoulders through; which was actually done in deep water, by a man who leapt from a coble, and was towed ashore by a rocket line. The life-boats—stoutly manned with hardy seamen, who would as willingly peril life in a storm to save their fellow-creatures, as exhibit on a gala day—manœuvred in beautiful style, the swiftness with which they ran *over* rather than *through* the water, being much admired.—*Sund. and Dur. County Herald.*

SCIENTIFIC MEMORANDA, AND NOTES ON ART.

British Association.—As everything relating to the approaching meeting of this association is now interesting, we beg to mention that, in addition to the list of scientific and literary men who have signified their intention to be present, there is Professor Gustavus Bischof, from Bonn, well known for his researches on the heat of the earth; Dr. Jacobi, from St. Petersburg, who has devoted much attention to the mechanical application of electro-magnetism, and other interesting points in physical science, &c. At a meeting of the directors yesterday, it was fixed that only 250 or 300 tickets could be allocated to Glasgow for the great diuner, which takes place in the theatre on Tuesday, the 22d current. To avoid all appearance of giving offence, the secretaries of the different committees are to give in a list of a dozen members each, and these are to be chosen stewards for the dinner by ballot. Some erroneous impression having gone abroad with regard to the admission of ladies to the meetings, we beg distinctly to state that the fair sex will be admitted on every occasion where their presence would be proper, and where, in the exercise of their own discretion and good sense, they would wish to appear.—*Gtasgow Chronicle.*

Importance of Oil in Woollen Manufactures.—It is a curious fact, illustrative of the importance of oil in woollen manufactures, that the beautiful texture of the Tunis caps have been found, by experiments at Constantinople, to be chiefly owing to the use of large quantities of oil during the manipulation of the wool and yarn. One-third of the weight of wool has been there employed, and the fabric nearly equals already that of Tunis. Precisely the same process, excepting the quantity of oil, is employed at Genoa, also the same wool; but the caps bring a sixth of the price of Tunis caps: one-tenth of the weight of wool is there used. Olive oil is used in all the celebrated cloth manufactories of France and Germany. The attention of the writer of this paragraph was first awakened to the question, by seeing olive-oil used in some of the cloth districts of Prussia, from whence rape-seed was exported to England to supply oil for the cloth manufacture in England. He inquired why they did not use rape-oil, which they had at their door, instead of olive oil, imported from the East, through Trieste, and conveyed by long and expensive land-carriage, making it several times the price of rape-seed-oil? He was told that experience taught them that rape-seed-oil had not the *smoothness* of olive-oil; that the fibre of the wool, when moistened by it, did not lie so well; that the cloth was not so soft or so brilliant; and that if their government taxed oil, so as to put it out of their power to use it, they would not employ rape-seed-oil, but abandon the manufacture of cloth.

Brandy from Potatoe Starch.—A great revolution is at present going on in the distilling trade, from the recent discovery that potatoe flour or starch is capable, by due fermentation, of yielding a very pure and well-tasted spirit. Some specimens have recently been submitted to the spirit-merchants, which even the most experienced among them have scarcely been able to distinguish from French brandy, for even the true *vinous* flavor of Cognac has been successfully imitated by certain chemical compositions, which the English refiners have been enabled to add to the spirit from potatoe starch. Three distilleries for the production of this kind of British brandy have recently been erected in the metropolis, and two of these are already in activity. One gentleman has imported no less than 1,000 tons of potatoe starch within the last three months from France and the Island of Jersey for this purpose; and it is said that the dealers in this commodity, are only apprehensive that the prospect of a war with France will put a sudden and speedy termination to this novel sort of traffic. The excise laws at present prevent the manufacture of starch from potatoes, in Great Britain and Ireland; but it is generally supposed by those most interested, that in the next session of Parliament these will be altered so as to permit the manufacture upon a very large scale.

Mode of Preserving Animals.—M. Salomon directs, for this purpose, that reptiles especially be immersed for two months in strong alcohol, and then placed in a stove, heated to 104 degrees, until they are completely dried. After this preparation, they may be kept for any length of time without exhaling any disagreeable odor.

VARIETIES.

Penny Postage Stamp.—To the Editor of the "Inventors' Advocate."—Sir,—In the "Advocate," of last week, I perceive a notice, that Her Majesty's face in the Post-office stamp, is, in future, to be "begrimed and black" as Othello's visage. Although a chemist, I would suggest a *mechanical* mode of preventing a fraud from the use of the stamps a second time, and one that is simple, efficacious, and I should conceive inexpensive; a mode, too, which in my mind, there can possibly be no objection to—namely, a stamper that will cut the pasted stamp into four or more pieces. It would then not be worth the trouble of detaching and affixing to another letter, and no matter how carefully done, it would be easy of detection. Even suppose the letter cut through, what possible mischief could be done? I suggest this mode, from a belief that there is no such thing as an indelible ink at present known. The nitrate of silver stain may readily be discharged.—Your's respectfully, A SUBSCRIBER.
Wolverhampton, Sept. 6.

Diamonds found near Algiers.—Three diamonds have been found in the auriferous sands of the river Goumel, in the province of Constantine. One of them weighs three carats. It is worth about £20, if free from flaws, according to the usual mode of computation; it has been obtained by the School of Mines at Paris. The second weighs 1¼ carat, and is possessed by the Museum of Natural History; and the third, by M. Le Drée, weighs one carat.

"L'Astrolabe."—It is not perhaps known by many, that the very identical "bell" which formed a part and parcel of the French ship l'Astrolabe, commanded by the ill-fated La Perouse (the destiny of which was never satisfactorily explained until Captain Dillon made a voyage to the South Seas, to make inquiries concerning her fate), is now in the Asiatic Society's Museum, in Calcutta. In the year 1827, he left the latter port for the South Sea Islands, when, after some time spent in making observations, he at length discovered from the natives, that about 40 years before (as far as he and Dr. Tytler could guess, from their method of calculating time) a vessel was wrecked off the island they inhabited, and that the whole crew, save and except one white man, were drowned; that the latter had lived with them some years, but had since died. Captain Dillon, in the course of his bartering, obtained from them a ship's bell, with the maker's name and the date of the year cast upon it, also three *fleurs de lis*, together with sundry small fragments of French china tea services, which left no doubt upon his mind that La Perouse and his unfortunate crew, for whose fate so much anxiety was entertained some years ago, were wrecked upon the coral reefs which nearly surround the whole of that island.

Wood Paving in the City.—On Tuesday, Sir Burgess Camac waited on the commissioners of sewers, sitting at Guildhall, in the City, for the purpose of applying for permission, as chairman of the Metropolitan Wood Pavement Company, to lay down the wood pavement of the company in some parts of the City. The commissioners gave permission to the company to make an experiment opposite Cripplegate-church, from Jewin-street to Whitecross-street. Mr. Stephen Geary also made an application to experimentalise with wood pavement. He requested, upon the part of the company called 'The Wood Paving Company," to be allowed to go to work, and was sanctioned by the commissioners to lay down three hundred yards in Leadenhall-street, opposite St. Catherine Church.

Travelling, Past and Present.—To exhibit the contrast between the present mode of travelling by railway, and what it was nearly 70 years ago in Bath, a gentleman now living in Widcombe states, that in the month of December, 1772, he had occasion to go to Frome, and the only coach conveyance was what was called a machine, which left the Angel Inn, on the Holloway side of the Old Bridge, at six o'clock in the morning for Salisbury, which it reached the same evening; he availed himself of this conveyance. They stopped to breakfast at St. Phillip's Norton, for about three quarters of an hour, and also to rest the horses, and reached Beckington, the nearest village to Frome, at half-past ten o'clock, a distance of ten miles from Bath, in four hours and a half.

Borough of Southwark Improvements.—Proposed New Street.—The report of the Metropolitan Improvements Committee having recommended that the sum of £30,000 be given towards the improvements of the borough of Southwark, it is proposed by a plan submitted by the architect, Mr. Hitchcock, for approbation, to form a new street from Gravel-lane, immediately facing Charlotte-street, Blackfriars-road, to St. George's Church, High-street, Borough. The contemplated street will intersect Prince's-street and Pepper-street, and take in the whole of Norfolk-street; then crossing the Southwark-bridge-road, include Mint-square and Queen-street, and remove the major portion of the houses between Redcross-street and the Borough High-street. It is intended that the houses to be built in the line of the new street, shall be first-class buildings, and thus form a handsome and convenient communication with Blackfriars-road. The houses which will be taken down to effect so desirable an alteration are in a ruinous state, and are of the lowest description, and the neighborhood will be much improved and benefited by their removal. Upwards of seventy of the most influential inhabitants have signed a requisition to the High Bailiff to call a public meeting to take immediate measures for carrying the plan into execution.

Extraordinary Waste of Liquid Manure in England.—It has been found, says Johnson, by carefully conducted experiments and very accurate gaugings, that the chief London sewers convey daily into the Thames about 115,000 tons mixed drainage, consisting on an average computation, of one part of solid and twenty five parts absolutely fluid matters; but if we allow only one part in thirty of this immense mass to be composed of solid substances, then we have the large quantity of more than 3,800 tons of solid manure daily poured into the river from London alone, consisting principally of excrements, soot, and the debris of the London streets, which is chiefly carbonate of lime; thus, allowing twenty tons of this manure as a dressing for an acre of ground, there is evidently a quantity of solid manure annually poured into the river equal to fertilising more than 50,000 acres of the poorest cultivated land! The quantity of food thus lost to the country by this heedless waste of manure, is enormous; for, only allowing one crop of wheat to be raised on these 50,000 acres, that would be equal to the maintenance (calculating upon an average produce of three quarters of wheat per acre) of 150,000 persons. London, too, is only one huge instance of this thoughtless waste of the agricultural riches of the soil of England; from every other English city, every town, every hamlet, is hourly passing into the sea a proportionate waste of liquid manure.

Ship Canal across the Isthmus of Panama.—It is stated in the American papers, that a Parisian company had sent out a ship freighted with engineers, laborers, and tools, for the purpose of constructing a ship canal across the Isthmus of Panama, so as to connect the Atlantic and Pacific oceans.

Railways at a Discount in the West of England.—So little comparative interest do railways excite in the West of England, that we understand there are individuals in Manchester who have a larger *bona fide* interest in the Bristol and Exeter Railway, than in the entire city of Exeter!—*Manchester Chronicle.*

Project for Blowing up Vessels of War.—It appears that some Americans who have taken up Fulton's torpedo project for blowing up vessels of war by grenades attached under water, are negotiating with the Chinese for rendering them assistance against the English men-of-war in this destructive capacity. The thing is not a mere speculation, but is known to be in practical existence, and has been ready to be applied in case of an American war ever since the burning of Washington.—*Egyptian Correspondent of the Times.*

Oxalic Acid.—It may be important to mention, especially in this suicide loving age, that two ounces of magnesia, mixed with about a quart of water, or the same quantity of common whitening, thrown into the stomach by any means (the stomach pump being readiest and most preferable on such occasions) will effectually neutralise and render inert this most active poison.

The Atmospheric Railway.—We understand Messrs. Clegg and Samuda, the patentees, are in treaty with the directors of the London and Croydon Company to adopt their principle upon the incline from New Cross to the Dartmouth Arms. This portion of the Croydon Railway is well adapted to exhibit the powers of the discovery, and, from its contiguity to the metropolis, will give all classes an opportunity of witnessing its properties. Some idea is also entertained of the atmospheric pressure being applied on part of the Blackwall Railway.

Launch of the St. George.—The launch of this fine ship took place on the 3d inst., in the presence of a great concourse of spectators. She was "christened," as sailors say, by Mrs. Warren, the lady of the Admiral-Superintendent; after which the dog-shores were knocked away, and she glided most nobly into the sea, amidst the enthusiastic cheers of the thousands assembled, the band playing "Rule Britannia." A more exhilarating sight could not be witnessed. The St. George is 2,719 tons, and she will carry 120 guns, namely—114 thirty-two-pounders, and six sixty-eight-pounders. She cost in building £93,521, which, with £30,000 for her equipment, a little exceeds the old estimate of £1,000 a gun. She was planned by Sir Robert Seppings, and has one of Roberts's handsome elliptical sterns.—*Plymouth Paper.*

Coaches on the Road to Weymouth.—Twenty five years since, there were only four coaches going to and from Weymouth; at this moment there are 16 four-horse coaches, seven omnibusses, besides steam-boats, &c.—*Dorset Chronicle.*

Departure of the Britannia for Halifax.—On Friday, the 4th inst., the mail steam-ship Britannia, which made, it will be remembered, the quickest passage ever performed across the Atlantic, sailed on her second voyage. She carries out about ninety passengers. The new Governor of Nova Scotia, Lord Falkland, his lady, and suite, are amongst the number. The extraordinarily brief passages

which the mail steamers have hitherto made to and from Halifax, cannot fail to secure to them full complements of passengers. At this season of the year, the new route will generally be preferred by travellers, but whether it can be performed in the winter remains to be seen. If it can, Mr. Cunard's line of steamers promises to prove as fortunate a speculation for himself as it must be advantageous to the country.

Steamers on the Pacific.—Extract of a letter from Captain Peacock, dated on board the Pacific Steam Navigation Company's steam-vessel, Peru, lat. 9 15 N., long. 25 50 W., out 14 days from Plymouth:—"The Peru has hitherto had a most prosperous voyage, answering in every respect my most sanguine expectations. On leaving Plymouth we experienced a head wind, with a heavy cross swell, until the evening of the following day, when I ordered the fires to be burnt down, blew out the boilers, and made sail. On this first trial of sailing, although deep, we got seven knots out of her. There was a good deal of swell on, and the vessel occasionally rolled deep, but after a minute investigation of the moveable parts of the funnel, I saw no risk in lowering it, and in eight minutes from the commencement I had the gratification to see it snug in the check, without straining a rivet or a rope-yarn. When the wind died away, we had everything in its place again, and the fires alight in four minutes from hauling taut the main gears. The operation elicited the admiration of every one on board, and the correct workmanship of the arrangement reflects the highest credit on Messrs. Miller, Ravenhill, and Co. The funnel, when down in the check, lies within the level of the paddle-box boats, and at a distance would resemble a long midship gun. It is completely out of the way of working the square mainsail, and when down, the operation of sweeping it is much simplified. We had only one entire day's sailing before getting into the trades, and then we had only three more. The trade wind was very light, except for two days out of the three, when, with the wind dead aft, with lower topmast, and topgallant studding sails set, we went 11 knots for four consecutive hours, and in 24 hours ran 225 miles. This was the greatest run under sail. The least was 140, and this was the fifth day of sailing, when near the edge of the variables. We only consume half a ton of coals per hour on the average, and find no difficulty in keeping steam, without the additional length of funnel. The Hull coals are excellent; and, in my own, as well as the chief engineer's opinion, are superior to the Llanelly coals. The sails all fit admirably, and the engines work extremely well. The vacuum now exceeds 28 in both. I perceive the great advantage of Sir W. Burnet's patent solution on the studding sails and awnings; it will increase their value 50 per cent. I am happy to inform you that my passengers are well, very contented, happy, and comfortable, which is daily expressed. I hope to be at Rio on the 26th day, of which there is every prospect."

Rather Quick.—It is stated that Mr. Brunel has wagered £1,000, that, on the completion of the Great Western Railway, he will go from Bristol to London *in two hours!*—*Bath Chronicle.*

Submarine Forest.—We have been favored with an inspection of several specimens of the fossil remains of this forest. It lies on the sea coast, below Seathorne, or Owthorne, and extends along the shore for some hundred yards, and probably a considerable way below low water-mark into the sea. The most prominent portion now visible, is to the north of the ancient site of Owthorne church, supposed to have been built early in the 13th century. Whether the ground on which this forest once stood, has experienced the change which has taken place through the agency of a convulsion of nature, or from the mere gradual encroachment of the sea, does not appear from any documentary testimony—we think from the last, the cliff above it being remembered by old inhabitants to have been much nearer the fossil remains than it now is, it must have been part of the mainland on which the forest stood. These remains consist of fir, beech, and oak, most of them in a carbonised state, and crumbling to pieces on any force being applied to them. A few months ago, the vertebræ and antlers of a stag were found, which are now in the possession of the Rev. C. Sykes, of Roos. The trunks and holes of many of the trees now visible, are from 12 to 18 inches in diameter, and from three to four feet above the surface, inclining in different directions, from a horizontal position, at an angle of about 30 degrees. The arms and branches are prostrate, and partially imbedded in the sand of the shore. The best time for a survey is the second and third day after the full and change of the moon, as the tides then ebb and flow the lowest.—*Hull Paper.*

HURRICANE AT PORT ESSINGTON, WESTERN AUSTRALIA.

(From the *Sydney Herald* of May 1.)

On Monday, the 25th of November, 1839, Port Essington was visited by one of those awful hurricanes so common and destructive in the West Indies, Mauritius, &c. The day previously there was nothing indicating any extraordinary change, as commonly precedes these storms, either in the appearance of the heavens, or in the temperature. About 7 o'clock in the evening, however, a squall from the southward worked gradually towards the settlement, and extended itself in a very heavy thunder storm, accompanied by most vivid forked lightning, with rain and wind. This continued for about three hours. The heavens were illuminated beautifully, there being scarcely a moment's cessation between flash and flash, and it appeared to issue from all points of the compass. The thunder almost instantaneously succeeded the flashes; the rain descended in torrents; gust followed gust so thickly that the whole scene was terrifically grand. When the fury of the elements was spent, the sky gradually became clear, but sheet lightning more than ordinary was seen during the night. On Monday the aspect of the heavens changed to a heavy lowering sky. A fresh breeze arose, with spitting rain—a certain precursor of an increasing wind. At 8 the wind moderated, but the sky was still lowering, and threatened heavy rain. At noon the wind increased, rendering it dangerous to venture in a boat to the shipping. At 5 p.m. the wind increased to a strong gale, but not the most distant apprehensions were entertained that so awful an hurricane would succeed it. At 8 p.m. it was blowing a heavy gale, and the barometer continued to fall; at 10 the hurricane commenced, rendering the scene altogether fearful in the extreme. Trees were torn up and falling about in every direction; large branches were carried by the force of the wind some hundred yards. Even the very stones themselves seemed animated, and flying, as it were, from the fury of the hurricane. Every house in the settlement, with the exception of the officers' mess-house, store, and hospital, was blown down. Government house was thrown from the piles on which it was built upwards of ten feet, and alighted on the ground, without, however, much injury. Every person was looking for a place of safety, but none appeared within their reach—they were expecting every moment to be crushed to pieces by the falling of heavy trees. Some escaped most providentially; one person was actually pulled out from under the ruins of a house. It happened that no lives were lost, or material personal injury sustained. The harbour was one sheet of foam. Her Majesty's ship Britomart was seen to drift before dark, and Her Majesty's ship Pelorus was riding heavily at her anchors. Both vessels were evidently preparing for the impending danger. From 10 till daylight the hurricane raged with unabated fury. At midnight the wind changed from south to east, and, in a few minutes afterwards, from east to north; blowing with redoubled effort, as if determined to root every thing out of the ground.

At daylight, the scene of devastation was melancholy in the extreme. The Pelorus was on shore on her broadside at Minto Head, having lost eight men including Mr. Keltie, the gunner. Many of the ship's company were up to their necks in water, and others were holding on by the weather rigging, the sea breaking violently over them. The church was blown down. All the houses, boat-sheds, armorer's shop, &c., were destroyed. Every boat in the colony, amounting to about 20, were complete wrecks. The only boats left were two on board the Britomart. The pier, with great quantities of provisions, tanks, casks, &c., was all washed away. The bananas, plantain, and all other kinds of trees and plants, were destroyed. The limbless trunks of a few trees were all that remained. Never could such a scene of devastation have been witnessed. Garden Bay, Mangrove Point, each participated in the surrounding ruin. Garden Bay was inundated, and the spars and boats driven a long distance inland. One well was filled up and strongly impregnated with salt: the water only became fresh after the wet season which followed. At Point Record, the sea had made a clear breach; the tide is supposed to have risen ten feet higher than usual. The wells there were salt three months after heavy rains. The Pelorus parted her cable and went on shore soon after the commencement of the hurricane. All the bodies save one of the unfortunate men who perished were picked up. The Britomart drove with the gale with three anchors ahead during nearly the whole time of the hurricane, and was seen at daylight out towards Spear Point, distant about a mile from where she was anchored, close to the Pelorus, off the pier. The bottom being a soft tenacious clay, it was thought next to impossible that a vessel could drive; and at times vessels have been obliged to wait for the flood tide to weigh them by purchase. Since the hurricane, not a bird of any kind has been seen; many were found dead the morning after it. In the settlement 8,000lbs. of biscuit were destroyed, and in the Pelorus about 5,000lb.; several bags of rice, and quantities of other provisions. Port Essington is now a perfect wilderness, and the injury done, it will take no little time to repair; in fact, what has been done during the last 18 months by 100 men is entirely destroyed.—*Perth Gazette.*

REPORTS OF SCIENTIFIC MEETINGS.

HORTICULTURAL SOCIETY.

The ordinary meeting was held on the 1st instant, R. H. Solly, Esq, F. R. S., in the chair. Several presents were announced, but none of these were of any importance. Dr. Lindley read a letter from Mr. Thornby, on several points of horticultural interest, amongst which was a suggestion for grafting the apple and pear upon the mountain ash, and this he particularly suggested for places in which it was desirable to render these fruits hardy; also some remarks on the subject from Mr. Thompson, of the Horticultural Society's Gardens, in which he stated that the plan which had been tried there was not successful, the trees not being long-lived, from the unequal expansion of the different kinds of woods. The collections of fruits occupied the greater portion of the tables, and were very superior. Mr. John Head, of Worthing, exhibited a seedling cherry of large size, and 26 of which weighed half a pound. It grew on a wall with a western aspect, and the tree was a good bearer, but the fruit was scarcely equal to the old Morella cherry. Mr. Robert Buck, of Blackheath, exhibited another variety of Deccan grape, different to that shown at the last meeting: and from Mr. Buck, gardener to the Hon. W. F. Howard, were some curious-formed Cornish grapes, which, from their shape, were called finger grapes, as they were neither oblong nor round. He also exhibited some of the grapes from which the Tokay wine is made, and some of Grange's seedling grapes. From Mr. Davis, gardener to Sir Simon Clarke, were some Muscat or Alexandria grapes; and Mr. Chapman, of Vauxhall, exhibited a fine tray of black Hamburg grapes. Mr. Davis also exhibited a Providence pine-apple, weighing 9lb 10oz.; and Mr. Parsons, gardener to A. George, Esq., F.H.S., some very fine Queen pine-apples. The collection of fruit from the gardens of the society was extensive, and an enumeration of the varieties may prove interesting. Of pears there was the Franc real d'été, Yutte, Hessel, chair à dame, Ambrette d'été, summer bergamot, and St. Pierre. In apples, there was the Gravenstein, one of the most valuable of the kitchen varieties, the summer, golden, and Leyden pippins; Mason's white and the Manx codlin. Of plums there was the Reine, Claude, violette, the real blue gage, which is, however, quite distinct from the fruit sold at nurseries as the blue gage, but being hardly second to the green gage, having proved a variety which cannot be too extensively propagated; damas blanc, a yellowish white plum, very good for culinary purposes; Virgin, Pond's seedling, diaprée rouge, and wine sour; there were the two best kinds of nectarines—the violette hative and elruge, and the peaches were George the Fourth, a very good kind, and Bellegarde, one of the best sorts. The show of flowers was not numerous, but there were some good specimens, the most prominent being a fine plant of Russelia juncea, from Mr. Davis. Mr. Lawrence, of Ealing-park, exhibited a fine collection, amongst which was a good specimen of Curanna roseveana,

with large scarlet bracts. Mr. Phillips, gardener to the Misses Trevor, of Woburn, exhibited a collection of linnias, and a new catasetum, with pale flowers. There were several interesting varieties from the gardens of the society. The prizes awarded were the silver Knightian medal to Mr. Davis, for his Providence pine-apple; and silver Banksian medal to Mr. Buck, for Deccan grapes; Mrs. Lawrence, for Curanna roseveana; Mr. Parsons, for a ripley pine-apple; and Mr. Davis, for Russelia juncea. The extract from the meteorological register, kept at the gardens from Aug. 18 to Sept. 1, gave barometer, highest, Aug. 29, 30,140 inch.; lowest, Aug. 18, 29,315 inch.: thermometer, highest, Aug. 30, 82 deg. Fahr.; lowest, Aug. 24, 43 deg. Fahr.; and quantity of rain, 0·65 inch. The meeting adjourned to Sept. 15.

ZOOLOGICAL SOCIETY.

Some extraordinary novelties were exhibited at the scientific meeting of this Society on Tuesday evening, by Mr. Gould, the well-known Ornithologist, who has just returned from Australia, whither he proceeded about two years since, for the purpose of collecting the requisite information for his forthcoming work on the birds of that interesting country.

Mr. Gould's indefatigable perseverance, his warm attachment to the study of Natural History, and his undoubted scientific attainments, well qualified him for his arduous and adventurous undertaking. His success has far exceeded his expectations, and he has brought with him the finest collection of quadrupeds, birds, their nests, eggs, &c., that has ever been imparted into this country. Mr. Gould has also made a very fine series of drawings, and obtained a vast fund of information connected with the objects of his research.

The subjects exhibited by him on Tuesday evening, were—a new and very singular species of lizard; two extraordinary bower-shaped playing-grounds, or "runs," as they are called, of the *Satin bird; Ptilonorhyncus holosericeus, Temm,* and *Chamydera Maculata, Gould.* These are the most singular examples of the architectural powers of birds that have ever been observed.

Mr. Gould then exhibited, and gave an interesting account of no fewer than six new species of that curious tribe of qusdrupeds, the Kangaroos, all of which possessed well-defined and distinct characters. A very powerful species was named by him *Macropus robustus;* another, remarkable for having a nail at the tip of the tail, considerably resembling that on the human finger, *M. unguifer;* a third, with elegant harness, like markings, commencing at the nape of the neck, and proceeding over the shoulders, *M. lateralis;* a fourth, remarkable for the smallness of its feet, sud for its fur closely resembling that of the English hare, *M. ptilopus;* a fifth, with a lunar-shaped mark over the shoulders, *M. lunatus;* and the sixth, being procured in the neighborhood of Nepean Bay, *M. Nepeanensis.*

Mr Cuming, who has lately returned from the Philippine Islands, afterwards exhibited an interesting series of new shells, belonging to the family *Helicidæ,* accompanied by the reading of two papers, in which their characters were given by Mr. Broderip and Mr. Sowerby.

LONDON MECHANICS' INSTITUTION.

Dr. Canter recently delivered a lecture here on the phenomena of sleep, dreams, and apparitions. He first took a slight glance of the muscular system, and described that condition called fatigue, which told man that muscular contraction could not be carried on beyond a certain period. Tho same circumstance takes place with the organs of sense, and an individual may continue to read till the book disappears from him. In going into a perfumer's shop, we are at first overpowered with the smell, which, however, goes off; and the most deafening noise becomes in time unnoticed. We say, that this is because we get accustomed to these, but it is the sensibility of the organ that gets affected, and it requires rest before it can again properly exercise its faculties. After we have been awake for 18 or 20 hours, the impressions on the mind become faint, and muscular motion is difficult; we then seek a place of repose in the position where the least muscular effort is necessary, and closed from the light, so that its stimulus shall not influence the eyes. The senses of sight, taste, smell, hearing, and feeling become dormant, and sleep arises from an exhausted sensibility in all these organs. No person in health should exceed six or seven hours in sleep; more impairs the health and debilitates the body. We rarely know an instance of any person who has become eminent in science and literature, who has not abridged his hours of sleep. Of these, Buffon and Grattan were examples, from the singular device which each adopted to wake at a certain hour, the latter placing over his head a vase of water, which ran over him if he overslept himself. The quantity of sleep requisite, differs according to the constitution, and there are some cases known in which two hours were sufficient in every 24. Dr. Gooch relates a case of a man who was in good health, and who had but half an hour's sleep in every 24 hours. Instances have been known in which persons have kept awake from three to six months; and one case is given of a person who kept awake for two years. A girl in Germany, having been fatigued with dancing, fell asleep, and did not awake for four days. A laboring man at Chilton, near Bath, slept for seven weeks, and soon after he awoke fell asleep again, and did not awake for ten weeks. A singular case occurred at the Hotel Dieu, where a man went to sleep periodically on Tuesday, and did not awake until Saturday; and amongst modern cases there is now a man at Bradley, near Huddersfield, who has been asleep for 10 months. The cause that produces these phenomena is undoubtedly tumors on the brain.

What difference, it may be asked, is there between persons whether asleep or awake? In the latter case we have imagination, and dreams of the future very active, but these are faint because they are modified by external circumstances which have no controlling power over them. When a person is asleep, there are no such external circumstances, to control ideas, which follow each in succession, and give rise to such absurd associations. Dreams, the lecturer contended, were produced by any circumstance which affected the circulation in the head. As a proof, he adduced an instance of a person, who, having a blister on his head, fancied that he was scalped in a dream; whilst another, who had hot bottles placed to his feet, dreamed that he was walking over the crater of Mount Vesuvius. Indigestible food taken late for supper is a very great cause of dreams.

The lecturer next adduced some curious instances of what are termed prophetic dreams, which seem to be verified by the antecedent events. A person is still alive who dreamed that he saw a person in a blue coat, with yellow buttons, shoot Mr. Perceval, the prime minister, which dream he related to his wife and friends, by whom he was treated with ridicule, although the catastrophe which he predicted occurred within a fortnight afterwards. Sir Humphrey Davy relates a singular circumstance of a dream in which he was relieved from a bed of sickness by a lady with fair hair, whose other peculiarities of complexion he described, and it singularly happened that a lady of similar complexion represented in his dream nursed him when dying, 20 years afterwards. The celebrated Dr. Harvey, who wished to go to Calais in a certain boat, was prevented making the voyage by his friend Sir Henry Brooke, who dreamt that the crew of the boat were all drowned—a circumstance that did actually occur. The Emperor Augustus believed implicitly in dreams, and ordered that every one should be registered before a competent tribunal. These were so numerous, that it was deomed necessary to issue an order that only the dreams of magistrates should be admitted. The question now to be considered was, whether any reliance was to be placed in dreams. Undoubtedly an excitement of the cerebral organs produced extraordinary faculties, and this extraordinary development is often observable on the approach of death. We are by no means, however, to imply that dreams are prophetic, because they sometimes prove correct. It is, on the other hand, extraordinary, taking, for instance, the number of dreams in London for one year, that no more prove correct. The lecturer next gave a pleasing anecdote of Flamsteed, the first astronomer royal st Greenwich, explained on the same principle of chance, He had been consulted by a laundress who had lost some linen, and, in order to get rid of her importunities, he told her that the stolen property was hid behind a certain hedge. Thither she went, and, to her joy, found it, ascribing all the credit to the astronomer looking in the stars to find it. In America, lately, there was a weather prophet, who published an almanac predictive of the atmosphere. Having left the 17th of June blank, this wss filled up by sn ignorant boy, who put in rain, hail, and snow, which prophecy was actually fulfilled in the state of the weather at that period.

The lecturer next adduced several cases of the phenomena of apparitions, first remarking on those produced by physical causes, as the spectre of the Brocken; the appearance of trees in the sandy deserts of Arabia, when the traveller only meets with the roughest herbage; spectres of ships seen at sea; the coast of France being visible at Hastings; and the case of the singular island in the neighborhood of Madeira, to explore which, six Government expeditions have been sent out, but which always recedes as the vessels advance. Individual cases of appearance were attributable to morbid states of the constitution, and several curious cases were adduced. The belief in all such phantasies would, however, he trusted, soon vanish before such institutions as that where he was then lecturing.

POLAR OSCILLATION.

To the Editor of the "Inventors' Advocate."

Sir,—Permit me to point out an error in the paper on this subject, in your last. Mr. Utting has mistaken the question; as his arguments show. It is not the pole of the earth, *quoad* the earth, or rather of the equator, (which alone would produce "variation in the latitudes,") but the pole of the ecliptic which is considered to revolve. The pole of the earth may remain exactly where it is, at 90 deg. distance from each point of the equator, and the earth may move on in its orbit in the zodiac, yet the pole of the earth (without any change in the earth itself) may incline less and less from the perpendicular to the orbit (at present 23½ deg.) until the ecliptic and the equator coincide; when, of course, the poles of both ecliptic and equator would also coincide. The seasons would then cesse, and perpetual summer reign throughout the earth. This, however, would not suffice for the tropical phenomena in the northern seas. But if we suppose the poles of the earth to go on revolving, they would, in half of the Hindoo *Maha-yug,* arrive at the plane of the ecliptic, and the sun would be vertical to tho polar regions. I would enlarge on this interesting subject, but fear further to occupy your valuable columns; and remain, Sir,

Yours, &c.,
R. J. Morrison,
Sept. 9th, 1840. Lieut., R.N.

THE THEATRES.

"Dullness" is still written over the theatrical hemisphere; and town is so empty of fashionables, that novelties, for somo time, will bo purposely withholden.

Covent Garden.—This establishment was opened for the season on Monday. The entertainments selected, were Shakspeare's comedy,—*The Merry Wives of Windsor;* and the romantic extravaganza, *The Sleeping Beauty in the Wood.* We saw nothing

in the cast of either, different from that of last season. Madame Vestris, and her husband, were loudly welcomed on their several entrances, and their friends—whose names were 'Legion'—gave them a most enthusiastic reception. As we observe the comedy is to be repeated very frequently, we think it as well to mention here, the principal *dramatis personæ*. First, of the ladies:—Madame Vestris played *Mrs. Page;* Mrs. Nisbett, *Mrs. Ford;* Miss Rainforth, *Anne Page;* and Mrs. C. Jones, *Mrs. Quickly.* Of the gentlemen,—Bartley, personated *Falstaff;* Charles Mathews, *Slender;* Cooper, *Mr. Ford;* Diddear, *Mr. Page;* F. Matthews, *Justice Shallow;* and Meadows, *Sir Hugh Evans.* All parties were perfect in their parts, and the "operatic comedy" went off well. The duet, '*I Know a Bank,*' sung by Madame Vestris and Miss Rainforth, was the gem of the evening. The afterpiece presented us with Madame Vestris in her pet character of the *Princess*, and with Harley as her grotesque *factotum.* It is a whimsical affair, but it has been played quite threadbare. The interior of the theatre presents its usual *coup d'œil;* it is *à la Vestris* throughout. By the by,—on Saturday last, we made known our wishes to the management, as expressed in our Paper of last week, respecting our privilege of entrée to the theatre. In courtesy, we looked for a reply; none has been received! *This* is NOT in character with the dignity of the establishment, and we feel it our duty to say so.

Twelfth Night, and Knowles' last new play, *Love*, have been played during the week, with the same cast of characters as before; and to-night, *The School for Scandal* is announced. A new play, by Mr. Sheridan Knowles, is heralded as forthcoming.

Haymarket.—We were very much pleased on paying a visit here last Tuesday evening, to find Mrs. Glover enacting the part of *Donna Violante* in the *Wonder*, and we could not but observe how delighted *Don Felix*, (Wallack) looked, to find so lively, animated, and graceful a lady *vice* Miss Helen Faucit, resigned. We can never allow that Mrs. Glover *can* grow old, the thing is impossible. Her size may, perhaps, with some, dispel the illusion of her being in her teens; but those who love buoyancy of spirits, easy action, graceful movements, and vivacity of expression, will ever esteem her as an evergreen. There is no sameness about her. With every change of dress, you see a distinct individual before you. For instance; let us take her *Mrs. Subtle* in *Paul Pry;* her *Donna Violante* in the *Wonder;* and her *Lady Almeria Milford* in *Quite Correct*, (to be performed to-night). These three characters will suffice to prove, that she can do what no other living actress can; *ergo*, she is a treasure. Wallack is firmly established here in public favor. *Martin Heywood*, in the *Rent Day*, is perhaps, one of the best of his assumptions. In the same drama, Mrs. Stirling shines transcendantly as *Rachel Heywood.* We never remember to have seen her to greater advantage. We recommend our readers to see this drama; it is well cast, and it possesses powerful interest.

The *Lady of Lyons* still draws good houses, but we fancy the performers are getting tired of its frequent repetition. Miss Helen Faucit is far, very far from being happy in her delineation of *Pauline.* Her whining and affected way of drawling out her aspirations of love, and the awful grimaces she makes while denouncing *Claude* for his deception, are all but intolerable. We felt little surprise, on Thursday evening, on observing how coldly she was received, although two very persevering individuals in the pit, repeatedly tried to "get up" a few "*bravas.*" Macready was very unequal in his performance of *Melnotte.* He felt the indifference of the audience, and it paralysed his efforts. He is so accustomed to extravagant applause, that, when he does not receive it, his spirit dies within him. Towards the close of the play, however, he rallied; for the half price gentry gave him a helping hand. We would advise him, before he repeats the character, to procure a wig better suited to the contour of his face. The ponderously-heavy black locks that half covered his cheeks, gave him the appearance of an old veteran, and we know he prides himself on his *juvenility.* The only natural and effective piece of acting, was that of Mrs. Stanley; who, as the *Widow Melnotte*, drew tears in abundance from the eyes of the audience,—both male and female. She is herself a mother; and had, therefore, only to act with a *mother's feelings:* the result was, a true picture of nature; appealing at once to every bosom. This is the highest meed of praise it is in our power to bestow.

New Strand.—Hammond is announced to make his re-appearance here on Monday, for the first time since his cruel persecution. His relentless creditor would, we hear, have prevented it, could *the law* have been strained so far; but it could *not.*

The Italian company, the most distinguished of whom are Grisi and Tamburini, appeared on Tuesday night at the Dublin theatre, in the opera of *Semiramide* and *Il Barbiere di Siviglia.* Among the personages present, were the Lord Lieutenant, Prince George of Cambridge, Lord Fitzclarence, the Countess of Carnwath, &c.

Amongst the passengers who have just left Havre for New York, is Mrs. Sutton, the American Prima Donna, who has returned from Italy. She is accompanied by her husband. Whilst singing at the opera at Bologna, Mrs. Sutton had the good fortune to be heard by Rossini, who was so delighted that, on the following day, he wrote a letter to her, in which he says—"You are destined to a most brilliant theatrical career. Happy is America which first produced such talent." Donizetti, who heard her in a private party in Paris last week, wrote a letter to her, in which he says—"I am certain that America is weaving for you the crown which you so well merit."

Dramatic Longevity.—Madame Lange, the sister-in-law of Mozart, for whom he composed many parts, is still upon the stage at Vienna, and lately acted to celebrate the fiftieth anniversary of her *debut.* A Mr. West, who was a dancer with Garrick nearly 70 years ago, lately took a benefit at the same theatre.

Amateur Theatricals.—Major General Sir John and Lady Burgoyne opened their elegant petite theatre, at Euston Lodge, Monkstown, on Monday last. The pieces performed on the occasion, were, *Puss in Boots*, and *Patience and Perseverance.* Among the company were—Lieut.-General Sir Edward and Lady Blakeney, Hon. Capt. Bruce, Hon. St. George Foley, Sir John and Lady Burke, Sir William and Lady Leeson.

Paris.—The Italian Opera of Paris is to open on the 1st of October with Bellini's *Puritani.* The company will consist of MM. Rubini, Lablache, Tamburini, Mario de Candia, Mirate, Campagnoli, and Morelli; and of Mesdames Grisi, Persiani, and Albertazzi. Though Madame Viardot (Pauline Garcia) has returned to Paris, she does not appear to have been engaged at the Italian Opera. Negotiations have been entered into between her and the Académie Royal de Musique, but the terms required by her are said to be such as to leave few hopes of their ending in an engagement. At this latter theatre, Mdlle. Heinefetter is engaged for three years at the rate of 20,000f. for the first, 30,000f. for the second, and 40,000f. for the third.

The negotiations entered into between Cerito and the Grand Opera of Paris, have failed. It is the manager of the Scala Theatre who has secured the services of Taglioni's young rival, by tendering her terms much superior to those which the Académie Royale was disposed to give her. Cerito has entered into an engagement at Milan, extending from the 28th ult. to the 30th March, 1842, but stipulating that she shall be at liberty to appear at Her Majesty's Theatre next spring.

The English Prima Donna at Paris.—Mdme. Anna Thillon, the beautiful and accomplished English prima donna, whose performances at the Theatre de la Renaissance, last year, were so much admired by the Parisian *dilettanti*, made her debut last week, at the Salle Favart, in Auber's celebrated opera of *La Neige*, with a success that will acknowledge but few precedents in the annals of the opera comique.

Madame Thillon is very young, and belongs to one of the aristocratic families of England. Carl Maria Weber, when in London, was retiring in the evening to his modest apartment in the city, overwhelmed by his sufferings both of body and mind, thinking of his beloved wife in Germany—of that wife who was to see him no more. A voice struck his ears, and restored him, as it were, to a new existence. "It is the voice of an angel!" he exclaimed, at the same time running towards the open window of a house, where a little girl, as fair, indeed, as a cherub, was singing with a *naïf* and pure accent one of the olden national ballads of Scotland. The child smiled at the enthusiast; her delicate hands threw back the fine curls of hair that shaded her uncovered shoulders, and she opened her little arms to the stranger, who was repeating—"You are an angel! You sing like the angels!"

Weber, entering the house, had got the juvenile singer in his arms, before he thought of apologising to her mother for the intrusion. But Mrs. Hunt knew the glorious personage who had just placed the charming little creature upon his knees, and she was proud indeed of the unexpected visit of the great maestro.

"You ought, Madame," said he to the mother, "to be thankful to God for the blessed gift he has imparted to your daughter; you must cultivate it; a day must come when a thousand voices will welcome her; when thousands of hands will unite to applaud her, and shew the truth of my prediction. Mrs. Hunt received the warning with a haughty smile; her noble ancestors, the large fortune of her husband, and the luxury with which she was surrounded, could not allow her to consider as possible the accomplishment of such a prophecy. Weber, in raptnre, left little Anna and her mother; he was to call again on the next day—and on the next day he did not call!—for he was seated in heaven between Mozart and Gluck.

Yet the dying man was right; his words were to be realised! Fifteen years after, a young woman, fair as the child of the city, *naïve* and graceful like her, and called by the sweet name of Anna, was singing at Clermont, in the rooms of Baron de Barante, and Onslow repeating to her the very words of Weber—"You sing like the angels!"

Various reports about the young cantatrice were circulated and credited among people of fashion. She was said to be the daughter of a rich merchant of London, whose wealth had disappeared in adventurous and unlucky speculations; that the loss of fortune had compelled her mother to leave England, and come over to France in quest of a retirement for a humble living. These and some other observations created a lively sensation at Clermont, and all aristocratic houses were opened to the fair Anna.

Miss Hunt subsequently became Madame Thillon. She left the modest stage of Clermont for the theatre of Nantes, where, during two years, she met with the most flattering reception. She was on the point of leaving France for Italy, when M. Antenor Joly heard her, and hastened to make proposals, which were accepted, for an engagement at *La Renaissance*, in Paris, where she achieved, in the opera of "Lady Melvil," a most decided triumph. The operas of *L'Eau Merveilluse* and *La Chaste Suzanne* are in reality indebted to her for their extraordinary attraction, and she has given to Lucie de Lamermoor the true and highly poetical coloring which belongs to the heroine of Walter Scott.

ADVERTISEMENTS.

TO IRONMONGERS AND BRASS FITTERS.

POTTS' PATENT PICTURE RAIL MOULDING, AND APPARATUS FOR SUSPENDING PICTURES.

The many advantages of the above plan having already secured very considerable patronage, which leaves no doubt of its being universally adopted, the Patentee begs to call the attention of the trade to the peculiar merits of his invention. The rail combines a moulding with the means of carrying pictures of any weight without bending; it can be fixed in a room after decoration without the least damage to the walls. The means of fixing is not seen, it can be made in any style, plain or enriched, of gold color or in iron for painting, and in all cases it will harmonise with the cornice, painting, or decoration of an apartment, and is equally adapted for the gallery or sitting room.

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PLATOW'S PATENT AUTOMATON COFFEE URN.—The peculiar excellence of this invention, consists in the application of a series of natural processes to the preparation of coffee. The boiling water is raised by the elastic pressure of steam into a separate vessel, remote from the fire; where the coffee is kept simmering with the nicest regulation as to time, and the degree of heat. When the elevation is complete, the coffee is instantaneously cleared by the pressure of the atmosphere, acting on a self-formed vacuum. By following the directions given, any person, however little conversant with cooking, may prepare as good coffee as it is possible to make (see "Inventors' Advocate," No. 57, and the "Mechanics' Magazine.") Sold at moderate prices by all ironmongers.

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RAILWAY MAGAZINE, AND COMMERCIAL JOURNAL. Railways, Banks, Mines, Steam Navigations, Assurances, Public Works, &c.—This long-established and extensively-circulated Work, which has attained the greatest celebrity for the value of its Articles, and its uniform success in all causes it has advocated, is now published WEEKLY, price 5d. stamped, and consisting of 16 closely and handsomely printed pages. It contains full and accurate Reports of all Railway and other Joint-stock Company Meetings; Steam Navigation; Asphalte; Accounts of New Companies, Banks, Mines, Assurances, Canals, Docks; a most important table to all travellers of the times and fares of all Railway Trains throughout the kingdom; unique and valuable tables of the prices of Railway and other Shares, Paper Money in circulation, Metals, Traffic of Railways, Meetings, Calls and Dividends, General, Mechanical, and Scientific Intelligence. A Tide Table for every day in the Week for each Port frequented by Steam Vessels.

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Mining Journal Office, 37, New Broad-street, City, 27th June, 1840.

NEW WORK ON THE IRON TRADE.—The Number of the MINING REVIEW this day published, contains the Sixth Part of the Paper on the IRON TRADE, by Harry Scrivenor, Esq.—this work will be completed in Twelve Monthly Parts, and so arranged as to form a separate volume at the end of the year; in addition to which the MINING REVIEW contains—A Paper on the Establishment of a School of Mines—On the Ventilation of Mines, by Samuel Moyle, Esq., C.E.—On the Preparation of China-Clay, by W. J. Henwood, Esq., F.R.S., &c.—On Blasting Limestone Rock, being an Account of Blasting the White Limestone in the Country of Antrim, Ireland, by William Bald, F.R.S.E., M.R.I.A.—On the Applicability of Peat to Manufacturing Iron—Parliamentary Returns of the Imports and Exports of Copper, Lead, and Tin, for the year ending 5th January, 1840—Scientific Bodies, &c.—The MINING REVIEW is published at the office, as above, on the 1st of each month, price Sixpence.

The MINING REVIEW is also furnished, to subscribers, as a Monthly

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The "MINING JOURNAL" is published at two o'clock every Saturday afternoon, at the office, 37, New Broad-street, City, to which address all Advertisements and Communications are requested to be addressed. Price 6d., and may be had of all booksellers and newsvendors in town and country.

THE SHIPPING AND MERCANTILE GAZETTE, London Evening Journal of Maritime, Commercial, and Political News,—combining all the essentials of a Daily Newspaper, with the prominent features of complete and exclusive intelligence on every subject connected with the Shipping and Trade of the United Kingdom The Shipping Gazette has obtained a character for correctness and usefulness unprecedented in the annals of Newspapers. It now commands an extensive circulation throughout the United Kingdom and the Colonies, on the Continent of Europe, in the United States of America, and other foreign countries; and is therefore a most eligible medium for commercial and miscellaneous advertisements, particularly those that relate to the sale, charter, freight, equipment, and sailing of vessels, and the sale of merchandise, and that have for their object the particular attention of Merchants, Ship-Owners, and Mariners, and those having dealings with them. The establishment of the Shipping Gazette forms a new era in the history of Shipping Intelligence; comprising, as it does, daily and complete announcements of the arrival and sailing of all vessels, in the coasting and foreign trades, together with an accurate account of vessels spoken at sea; state of winds and weather; accidents; losses; rates of foreign and coasting freights; premiums of insurance; wholesale prices of goods; stock-exchange news; coal, corn, and other markets; which information is regularly furnished and derived from the most authentic sources at home and in foreign countries trading with Great Britain. The Shipping Gazette further embraces a comprehensive detail of domestic and miscellaneous intelligence; records of all important events; reports of parliamentary proceedings, public meetings, decisions of law and police courts, &c., especially such as refer to nautical and commercial matters; and altogether contains a larger mass of information than is afforded by any other Evening Newspaper. The Shipping Gazette is frequently referred to by witnesses examined before Committees of the House of Commons, as furnishing the most authentic evidence on maritime affairs. Orders, communications, and advertisements for the Shipping and Mercantile Gazette, are received by its Agents at the respective out-ports, and by any News Agent in town or country. Advertisements and communications to the Editor, may be sent to the Publication Office, No. 54, Gracechurch Street, London.

COLLEGE for CIVIL ENGINEERS.—NOTICE IS HEREBY GIVEN, that the College has been removed from the temporary premises at Kentish Town to very spacious and airy freehold premises at Putney, the purchase of which has been effected by the Council; the students reassembled on Thursday the 13th inst.

By order of the Council,
J. E. B. CURTIS, Secretary.

Every information as to terms, mode of admission, and the general regulations of the College, may be obtained by application to the Secretary, at the Office.

Office, 9, Villiers-street, Strand.
August 13, 1840.

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For prospectuses or shares, on which £1 per share deposit must be paid, apply (pro. tem.) to W. H. Lammin, Esq., solicitor to the Association, at his office, 5, John-street, Adelphi, on or before the 1st day of September next, when a Meeting of the Shareholders will be convened, for the election of Directors and other officers.

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N.B. A Solicitor is in attendance, daily, from Eleven till Two o'Clock, who may be consulted on all points of PATENT LAW.

London: Printed by JOHN EAMES, 7, Tavistock-street, in the parish of St. Paul, Covent Garden, in the City of Westminster; and Published for the Proprietors, by WILLIAM KIDD, at the Office, 7, Tavistock-street, Covent Garden, (as aforesaid) to whom Books, &c. for Review, (addressed to the Editor), should be forwarded. Saturday, September 12th, 1840.

THE

INVENTORS' ADVOCATE,

AND JOURNAL OF INDUSTRY;

A WEEKLY BRITISH AND FOREIGN MISCELLANY OF

INVENTIONS, TRADE, MANUFACTURES, LITERATURE, AND THE ARTS.

PRINTED BY JOHN EAMES, 7, TAVISTOCK STREET, COVENT GARDEN.

No. 60.] SATURDAY, SEPTEMBER 19, 1840. PRICE FIVEPENCE STAMPED. CIRCULATING FREE BY POST.

SCIENTIFIC OBSERVATIONS MADE DURING THE FRENCH VOYAGE OF DISCOVERY.

At a recent meeting of the French Academy of Sciences, M. Arago read a report containing the results of the scientific observations made during the recent voyage of discovery round the globe by the French frigate *Venus*, under the command of M. Dupetit-Thouars. The mode of ascertaining the longitude generally observed during the voyage, and which is recommended in preference to the use of chronometers, was by lunar observations; by which means alone the exact position of the ship after a voyage round the world was found with great exactness. The four chronometers taken out by the *Venus*, which were made by the best French makers, entirely failed. Two of them became useless, and would not go before half the voyage was completed; and the two others went so irregularly, that no dependence could be placed on them.

During the course of their voyage, barometical observations were constantly made with the same instruments; by which means additional data will be supplied respecting the zones, in which the mercury continues constantly either above or below the average height. These stated differences, which are now well established, but which philosophers hitherto have not admitted to exist, deserve to be studied with the greatest interest, because they are, without doubt, caused by the inexplicable currents of the atmosphere and of the ocean. If we bear in mind the relation which M. Daussy has so completely established to subsist between the height of the tides and the height of the barometer, the barometrical observations made on board the *Venus* will command the attention of those who are interested in the subject.

On the recommendation of La Place, the Academy, some years since, appointed a numerous commission to determine, with all possible precision, the different quantities, perhaps gradually variable, which affect the physical changes of the globe. One thing to be attended to, for example, was, to analyse the air of the atmosphere in a great many different latitudes, on the sea, in the middle of continents, and at different heights; to trace the exact range of the isothermal lines at the present time; to submit to mature consideration the law which regulates the decrease of the temperature of the atmosphere according to the height; and, if necessary, to take new aerostatic voyages for that purpose; to ascertain by experiments, capable of being at all times repeated, the degree of light and heat of the sun; to measure, in a certain number of stations conveniently chosen, the peculiar phenomena of terrestrial magnetism, comprising the absolute intensity of that mysterious power, which, in every part of the world, guides the needle, &c., &c. The commission, as every one may conclude who looks at the extensive nature of the required researches, has not yet made its report. The commissioners have met only once, for the purpose of apportioning among the different members the particular subjects which each was required to investigate. That member who had been charged with the duty of determining, to a small fraction of a millimetre, the average height of the barometer at the level of the ocean and under different latitudes, states, that the observations made on land during the voyage of the *Venus* entirely completes the numerous documents on the subject which he had previously collected. From this time, therefore, we shall be able to fix with precision, for the first half of the nineteenth century, the absolute amount of the pressure of the atmosphere in our latitudes, and in the equinoctial regions; to estimate the great influence which the winds of different quarters of the globe exercise on the atmospheric pressure; to transmit to succeeding philosophers the means of ascertaining whether the absorptions and disengagement of gas, which chemists have studied, exactly balance each other, or whether, on the contrary, the terrestrial atmosphere will be finally exhausted.

During the whole voyage of the *Venus*,—that is to say, from the 1st of January, 1837, to the 20th of April, 1839,—exact observations were taken from hour to hour, both day and night, of the temperature of the atmosphere and of the sea. Philosophers are generally agreed respecting the importance of having meteorological observations accurately made in the neighborhood of the equator, at a distance from continents and large islands. They have also been of opinion, that between the tropics, and in the open sea, the temperature of the water varies little; that the average of ten, twelve, or twenty analogous observations made indiscriminately between ten degrees of north and ten degrees of south latitude, would be within the fraction of a degree the same; that, by establishing this fact, they might apply themselves successfully to the consideration of the hitherto undecided question of the constancy of the terrestrial temperature, when not disturbed by local influences proceeding from the clearing away of forests, the change of culture, the draining of lakes and marshes, &c.; and that the philosophers of each century, by transmitting to those of the next some data of this kind, easy to be obtained, would probably furnish them with the most simple, exact, and most direct means of deciding whether the sun, which is at present the first and almost the exclusive source of the heat of our globe, changes its physical condition and splendor, like most of the stars, or whether that luminary has attained in those respects a permanent condition. The observations made during the voyage of the *Venus* have tended to support these views.

The determination of the greatest depths of the ocean, is a subject of not less interest and importance than that of the greatest height of mountains. Philosophers will, therefore, be interested with the result of two experiments performed during the voyage of the *Venus;* one in the neighborhood of Cape Horn, the other near the Line, in the Pacific Ocean. On the 5th of April, 1837, in 57 deg. 0 min. south latitude, and 87 deg. 7 min. west longitude, at a distance of 185 leagues to the east and 8 deg. south of Cape Horn, and 140 leagues distant from the nearest land, in a calm sea and a fine day, they commenced at nine o'clock in the morning to let out a line weighted at its ends, first with the lead usually employed in sounding, and which had also fastened to it a thermometrograph, enclosed in a thick case of brass. At five minutes to ten o'clock, they had let out 24 lines, measuring altogether 2,500 fathoms. Making allowance for the inclination of 15 deg., determined by that part of the line which was visible, it was found that the lead had descended 2,411 perpendicular fathoms, that is to say, nearly 4,000 metres (almost three miles). Sixty sailors were employed for two hours in hauling in the line, when it was found that the lead had not reached the bottom. The second attempt was made on the 27th of June, also on the Pacific Ocean, at a point situated in 4 deg. 32 min. north latitude, and 136 deg. 56 min. west longitude, at a distance of 236 leagues from the Bunker Islands. At that spot a sounding, made with the same precautions, in very favorable circumstances, that is to say, in a dead calm, proved that the depth of the ocean was 3,790 metres. These soundings, the most remarkable perhaps of any that were ever made, confirm the opinion, that, if the sea were to be dried up, we should see in its bed, extensive valleys and immense chasms quite as much depressed below the present general surface of the dry land, as the highest summits of the Alps are above it.

The height of the waves during tempests on the

open sea, was until lately unknown. It was formerly imagined by some navigators, that the waves sometimes reached the height of 33 metres. Truth has since, however, been substituted for romance; and it has been found that the highest waves do not exceed from six to eight metres. The highest wave that struck the *Venus* in the course of her long voyage, was seven metros and a half high. It was on the south of New Holland that the *Venus* met with the largest, if not with the highest waves; there the waves were estimated to be three times the length of the frigate.

The subject of terrestrial magnetism is become a world of itself. It will require ages of observations to throw light upon the hundreds of phenomena it already comprises, so as to discover the laws which govern them. The *Venus* has added a great many additional valuable facts as her tribute to the science of terrestrial magnetism. For example, as regards the question whether the diurnal horizontal oscillation of the needle is every where the same, at the same hours of the day; whether, for instance, the movement which in the morning carries the north point of the compass from the east to the west in our hemisphere, and from the west to the east in the opposite hemisphere, takes place at the same time; whether the hours correspond to the extreme limits of these oscillations, or, in other words, whether the hours of the maxima and the minima of declination are identical throughout the globe. We can now affirm that it is not so; and that the needle reaches the limits of its diurnal range at different hours of the day, according to the different climates.

The report concludes by recommending the Academy to request the French government to publish, without delay, all the observations of every kind made during the voyage of discovery by the *Venus*. An early publication, it is observed, is the more necessary, as the discoveries and facts which the French navigators have made and established, may otherwise be forestalled by those results of the voyages of discovery now making by the English, the Americans, and other nations.

ON THE USE OF GELATINE, EXTRACTED FROM BONES, AS FOOD.

An observation of the facts, that bones when thrown on a fire burn with flame, that the smell which arises during their reduction to a state of charcoal resembles that of burnt horn and that many kinds of animals eat bones, and prefer them to other food,—might lead to the inference that bones contain a large quantity of animal matter, and that this matter is of a nutritive kind. The knowledge of this fact may be traced to remote antiquity, but it was not until the year 1681 that the composition of bones was well understood, and that it was proposed to extract the animal matter from them, and employ it as food for man.

The animal matter which bones contain, is known under the name of gelatine, and it is of the same nature as isinglass, and of those parts of animal food which are dissolved in hot water, and become jelly when cold. One hundred kilogrammes of dry bones contain on an average 30 kilogrammes of pure dry gelatine, and eight or ten kilogrammes of fatty substance. One hundred kilogrammes of dry bones yield very readily 36 kilogrammes of pure dry alimentary substance; whilst 100 kilogrammes of butcher's meat after the bones are taken out will yield only 33 kilogrammes of food in a dry state. It may therefore be said, that an equal weight of dry bones contains more nourishment than the same weight of butchers' meat. We thus perceive how much nourishment is lost when the bones are not used as food.

The celebrated Lagrange said, in 1791, that in France each individual had only half the quantity of meat to eat that was given in a soldier's ration; and the statistical tables prove that since that period the condition of the French, in respect to the consumption of meat, instead of being improved, is more and more diminished; so that it is impossible to see the end of the evil or to stop its progress. But it is evident that the serious effects of this diminution in the consumption of butchers' meat are felt only by the poor; in fact, that which is to the rich merely a little additional expense, is, unfortunately for the poor, the cause of an almost entire deprivation to them of the food of which they have the greatest need.*

In this state of things there is no choice. There is an absolute necessity to improve the food of the working classes, and to increase the quantity of animal nourishment they take. This cannot be done by supplying them with butchers' meat, but gelatine prepared from bones may be procured at very little expense. We are forced, therefore, to come to this conclusion; that it is not only convenient, but absolutely necessary, to have recourse to the gelatine of bones, if the working classes are to have a greater quantity of animal food, and if their condition is in this respect to be improved as much as it is possible.

The hospital St. Louis has had an apparatus for making gelatine, upwards of ten years; and during that time nearly a hundred thousand invalids, convalescent patients, workpeople, and beggars, have been fed there with foods animalised by gelatine.

The army of 40,000 men sent to Africa has consumed since its departure 400,000 biscuits, animalised by gelatine extracted from bones, each biscuit containing 276 grammes. The gelatine extracted from bones and made into thin sheets, is now sold in all the large druggists' and grocers' shops, where it is purchased by the tavern keepers and cooks for the use of the rich. All the makers of preserved meats extract gelatine from bones, and use it for filling the cases into which the meat is put; and these also are intended for the richer classes of society. These facts show that the subject is one of great importance, and is well worthy the consideration of men who study to improve the lot of the poor, to increase the comforts of the working classes, and, by this means, to secure public tranquillity and the stability of our institutions.—*Moniteur Industriel.*

* In 1789, each inhabitant of Paris consumed on an average 208 grammes of butchers' meat in a day; in 1838, the average quantity for each individual was reduced to 135 grammes per day.

NATIONAL ACADEMY OF DESIGN,—NEW YORK.

In the fall of 1825, several of the artists of this city, feeling the want of harmonious intercourse and improvement in their profession, associated themselves together, for the purpose of drawing from the antique and other models, during the winter evenings, and, as originally proposed, at the house of one of the projectors of the plan. The number who immediately signified their wishes to become participators in the advantages of the scheme proved this arrangement to be too limited, and an effort was made to procure more ample apartments, which they obtained by the generous loan to them of the rooms of the Historical and Philosophical Societies, successively.

The Society was by common consent called the Drawing Association. A small sum was contributed by each member, to defray the necessary expenses of light and fuel. Officers were chosen to manage the business attendant on this primitive formation, and the artists and students of the art became an organised body; but, at that time, with no other intention than that of mutual intercourse and improvement in the art of drawing.

Circumstances of a controversial character, with the American Academy, entirely unnecessary here to be introduced, soon changed the aspect of affairs, and caused the associated artists to project the plan of forming an academy for the encouragement of the fine arts, in conformity with their own views of what such an institution should be. The plan was matured, and the National Academy of Design was the result. The drawing association consisted of some thirty or forty members, some of them professional artists, some amateurs, and some students of the art; all enjoying equal privileges in the association, and all interested in the creation of the new society. It was obvious that materials so diversified could not enter into the formation of the new Academy, now about to assume a definite character and object, in the same heterogeneous mass as in the primitive association. How the one should resolve itself into the other; who should be constituted members of the new society; how they should be classed, or how selected, was the difficulty to be overcome, and was ultimately accomplished as follows: The members of the drawing association, at a meeting called for that purpose, elected by ballot fifteen professional artists from among their own numbers; the fifteen artists so selected, were, by the tenor of their election, empowered to assemble forthwith, and to choose by ballot not less than ten, nor more than fifteen more professional artists, either from within or without the association:—the whole number consisting of the original body, and those selected by the fifteen, to constitute the new society. Thus was formed the National Academy of Design.

Its great ruling principle was, and is, that its government should be entrusted entirely to artists.

Its objects were, instruction, exhibitions of the works of living artists, and the promotion of mutual intercourse and harmony in the profession.

The work had now fairly commenced. The following extract from the letters of Boydell, an anonymous writer of the period, will give a vivid idea of the early struggles of the infant institution: "Immediately after the organisation of the new Institution, measures were taken to open its first exhibition; and, notwithstanding the many difficulties under which they labored, at this commencement of their undertaking, such as the want of convenient and properly-lighted rooms, &c., the artists succeeded in collecting together such a display of talent as surprised every visitor of their newly-formed gallery; consisting of works of living artists only, which had never before been exhibited, and which, by the rules of the Institution, can never be included in any future exhibition—a plan which ensures novelty at least. The expenses of this, their first year of existence as an Academy, were somewhat greater than the proceeds of their exhibition, and the deficit was provided for by a small assessment upon the members, which was promptly and cheerfully paid. Not discouraged by this result, they immediately determined on another effort in the ensuing year; and, to defray the expenses of the school, they concluded to receive from students a small sum, sufficient to meet the expenses of lights and fuel. In their second annual exhibition—in which was found a more splendid display of living talent than had ever before been presented in this city—they were more successful—their receipts not only defrayed expenses, but left them something in the treasury. Now, however, their greatest difficulty arose; the room in which the students assembled, to prosecute their studies, had been, till this time, loaned to them, but the society which had so generously befriended the Academy could spare the room no longer. No alternative, therefore, was left them, but to hire a room, or break up their school. An application for assistance to the Common Council was not listened to; they therefore resolved to incur the risk of hiring, for the year, the room in which they had made their exhibition, over the Arcade Baths, in Chambers Street."

In this room the Institution continued until the

increase of students, and the number of works of art offered for exhibition, rendered it no longer sufficient for their purposes, and they ventured upon leasing, at a greatly advanced rent, the rooms of the upper story of Clinton Hall, where it was believed ample accommodations would be obtained for all their purposes. This removal of the Academy from Chambers-street, to the Clinton Hall, with its attendant expenses, was a step hazardous almost to the existence of the infant institution; and a combination of unforeseen circumstances rendered the measure one of serious embarassment. On the approach of the usual time for preparing for the annual exhibition, it was found that many exhibiting members were absent from the city, and, as a consequence, were not likely to send works for exhibition. This deprived the institution of the ability to present its usual display of talent. In this dilemma, it was proposed that the exhibition, should, contrary to rule, consist of works previously exhibited, and (by selection of the artists,) be a review of the most prominent works of the previous exhibitions—no new pictures.—By this means, the Academy prepared an exhibition far surpassing any that had been produced under the limited rule of excluding all pictures that had been previously exhibited. Its success was complete—one objection only was made on the part of the society, *viz.* the unfavorable contrast the exhibition of the yearly product would undergo, in comparison with its more fortunately selected rival. It was, however, resolved, that every sixth exhibition should be a selection from, and a review of, the works exhibited in the preceding five, though the cause that produced the first had happily ceased. For some time the institution continued its progress, varying but little in its duties or its results, gradually increasing its usefulness, and, of course, its expenses. The increased attention given by the public to its exhibitions, enabled it always to meet the latter.

After surmounting so many difficulties, it was discovered that it had to contend with a new enemy—and if report speaks truly of the "business" qualifications of the profession—one they were least likely to encounter with any degree of success. The institution was found suddenly to have incurred—if *incurred* it may be called—a considerable debt, and that in a manner the most unusual and unlikely to produce such a result; to wit, by the generous donations of its friends. This singular anomaly may be thus explained. The presents received, were "casts" from the antique statues, and other useful material, selected by its friends in Europe, and consigned to the care and use of the Academy in New York. The result, ultimately highly advantageous to the institution, was otherwise at that time. The freight bills alone were more than the treasury had ability to pay, and, of course, plunged the Academy into debt; to meet which they had only the revenue of the ensuing annual exhibitions. The receipts of any one of these (at that time) in gross, would not have paid the amount. It was obvious the whole receipts could not be so appropriated. The exhibitions must be continued—the expenses of creating the same must be paid, to enable the society so to continue them. By continuing them only could they hope to obtain the means, ultimately, of paying the demand. Under this, their treasurer submitted to the council, a statement of the revenue of previous exhibitions, an estimate of the probable receipts and expenses of future exhibitions, accompanied with a plan for the gradual liquidation of the debt, under the then existing capabilities of the institution. This gave a ray of hope—though the question was naturally asked, "Would the creditors consent to wait for payment?" Be that as it may, it was the only mode proposed, and the only means in their power to offer, consequently, was unanimously adopted by the council, and the treasurer appointed a committee, forthwith, to make a statement to the creditors, and to endeavor to obtain their consent to the measure. The statement was made, and consent obtained. Two years within the period asked, the institution had the satisfaction to find itself out of debt, and its creditors paid, in full, with interest.

Having overcome this difficulty, the Academy has, from that period to the present, proved prosperous, and gradually accumulated a property which has enabled them to extend their accommodations to the students—to establish the "Life School," in addition to the "Antique," to award premiums, and otherwise to place the students' department of the institution on the footing of the most approved European schools of a similar character. They have, also, by the same means, been enabled to enlarge the accommodations for their annual display of the works of living artists, consonant with the increase of exhibitors.

The demands on the institution prove that they are still in want of accommodation, in many important particulars, to meet the requirements of an increasing body of artists, and to carry out the intentions of the institution. They have, therefore, determined on another removal, to the still more ample and better lighted rooms, in the new building erected by the New York City Library Society and Atheuæum, where we understand it is their intention to fit up their gallery in the best possible manner. The want of direct light, so much complained of in the present exhibition room, is entirely obviated in their new apartments, by the proper construction of the lights.

We cordially wish them success. They are the pioneers of independence in the arts of design in our country; and every artist who cherishes the true spirit of independence in his profession of harmony with the republican spirit of the institutions of his country, should be with them.

We heartily concur in the writer's wishes for the success of the artists. They have produced an institution in a spirit of liberality worthy of the city. They have no salaried offices to fill with members; all the receipts are devoted to the general benefit of the society; and that no error may be promulgated to their injury, as to the uses or manner in which they apply their rapidly-increasing funds, we have asked for, and been favored with a copy of the last year's treasury report, from which we publish such a summary as will give our readers a general idea of their receipts and expenditure for the year, and the amount accruing over and above the same, to the permanently invested funds of the Academy, which, with the permission of the society, we will furnish annually.

Total receipts of the year from all sources,	5,170 86
Expenses of institution, including exhibition, schools, &c.	2,470 86
Works of art purchased in Europe for the library, by order of the council, . .	700 00
Amount carried to the invested fund of the institution, ...	2,000 00
Dollars	5,170 86

[From the "*American Repertory, No.* 1;" an Interesting Scientific Periodical just published.]

SPECIFICATIONS.

ENTERED AT THE ENROLLMENT OFFICE.

(Continued from page 163.)

LUKE HEBERT, of Birmingham, Warwick, civil engineer, *improvements in the manufacture of covered spades and shovels, soughing and grafting tools, and other implements of a like nature*, Sept. 7.—The usual method of forming a spade, is to take two plates of iron, called half-moulds, and to insert between them a wedge-shaped piece of steel, and then weld the whole together, and afterwards tool or plate it out, until it assumes the proper form.

The under-side of the spade, by dint of working, becomes worn away at an angle with the face, giving the tool a chisel-like form at its edge; and the iron forming this edge, not being sufficiently hard to overcome the impediments it meets with in working, becomes jagged, and is constantly fouling, to the great annoyance of the workman.

The claim is for welding the two half-moulds together in the first instance, and then welding the steel upon the face of the upper iron; when the whole having been plated out, by rolling or otherwise, a chisel-shaped edge of steel will always be presented to the soil, which will cause the spade to work much cleaner, and with great economy of labor.

CHARLES KOBER, Leeds, cloth manufacturer, *improvements in fixing colors in cloth*, Sept. 5.—By using bichromate of potash, as a medium for uniting the ingredients or wares, used in dying wool and cloth, one pound of which, instead of three or four pounds of alum, or copperas, will produce a brighter, faster, and cheaper color in cloth, also rendering the wool softer, and more easily milled; therefore, the same quantity of wool will produce a greater quantity of cloth, and of a better quality. The inventor generally uses three pounds of the bichrome of potash, in preparing one hundred pounds weight of scoured wool.

By producing a fast green color in cloth, by having the wool dyed blue, then manufacturing the cloth from the blue wool, leaving a white or light-colored list, and afterwards applying the yellow ingredients to the cloth, any of those usually employed will answer, but fustic is preferred, being of a brighter color. In fixing this color, the inventor uses hydrochloric acid, saturated with lime, to which water is added, till the solution obtains a specific gravity of 12612, or 30 deg., six or seven pounds of which solution are used in preparing one hundred pounds weight of cloth.

Also, the use and application to indigo, of soda and bran, or soda ashes and bran, either by themselves, or mixed with woad or madder, for the purpose of dissolving the indigo and other ingredients, and thereby producing a better and cheaper color than can be obtained from the ingredients usually employed. Let a seven feet vat be heated to 125 deg., then throw in 65 lbs. of bran, 35 lbs. of soda, 4lbs. of indigo; then let it be heated three or four times in the course of the day, to from 110 deg. to 118 deg., and again in the evening to 125 degrees, adding 4 lbs. lime, 6 lbs. bran, 5 lbs. soda; if the above be used for eight or ten weeks, the sediment should be drawn off, and a new vat set from the old one, adding 13 lbs. bran, and 10 lbs. soda, with indigo, according to the color required, and lime in a proper quantity, to deprive the indigo of its oxygen, without producing an immoderate fermentation.

Claim first.—The use of bichromate of potash, as a substitute for copperas, and other mordants, usually employed in dying wool.

Second.—In producing a fast green color, by having the wool dyed blue, and applying the yellow ingredients to the cloth.

Third.—In the use and application to indigo, of soda and bran, or soda ashes and bran, for producing a better and cheaper color than can be obtained from the ingredients usually employed in dying wool.

HAYWARD TYLER, Fore-street, Milton-street, Cripplegate, London, brass-founder, *improvements in machinery for impregnating liquids with gas, including bottles for retaining and preserving liquids so impregnated*, Sept. 7.—The pump used has two suction valves, and two distinct suction pipes, one for bringing gas, the other for bringing liquids, from proper receptacles. The gas and liquids are not allowed to mix together until they have entered the barrel The valves are like conical plugs, fixed to the barrel at opposite sides, and fitting in corresponding conical seats at the bottom of the valve chambers, and are supported in a perpendicular position by four leaves, fitting in the cylindrical interior of the barrel.

The pump for lemonade is double, and may be termed two pumps in one barrel; at the upper end of the barrel is fixed a collar of leather, in which a cylindrical plunger is fitted, the upper end of which is joined to the lower end of the double pump rods,

—the plunger works up and down in its collar of leather; at the lower end is a piston, which fits the barrel, and they work together as a forcing pump: the upper end is for liquids, the lower end for gas, so that when the piston is drawn up, the gas enters the lower part, and on its being forced down, it compresses the gas, and forces it, in a compressed state, into a proper recciver; tho liquid is at the same time entering the upper part, and on the piston being drawn up, is also discharged into a receiver.

Two pumps, worked by one lever, may be made to produce the same effect, by having a small pump for compressing the gas, and a larger one for the liquid, and both discharging through separate valves and pipes into the same receiver.

The improvement further consists in having an interior vessel of glass, pottery, or clean metal, to fit inside the recciver, that any liquids contained therein may not receive any taint from the metal of which the receiver is composed. The interior vessel is made of the same shape as the receiver, which is jointed at its dome with a flange joint, and may be unscrewed to admit the interior vessel.

Also in the improved construction of bottles for holding liquids impregnated with gas. They are made with an additional small neck, at the end or bottom of the bottle, by which the bottles are filled, the other end having been previously stopped in the usual way; the passage into the bottles being very small, there is less of gas than by filling them in the usual manner.

Claim first.—In applying two distinct suction valves to a forcing pump, by which gas and liquids are forced togcther into a receiver, for the purpose of impregnating such liquids with gas.

Second.—In a double acting pump, by which gas and fluids are forced separately into a receiver.

Third.—In two single pumps for the same purpose.

Fourth.—In applying an interior vessel within the receiver, to contain the liquid to be impregnated with gas.

Fifth.—In an improved construction of bottles, for keeping or prescrving liquids impregnated with gas.

William Maltby, jun., of Mile-end, chemist, and Richard Cuerton, jun., of Percy-street, brass founder, *improvements in extracting and concentrating the color, tannin, and other matters contained in vegetable and animal substances*, Sept. 7.—A copper boiler is set in a water-bath, with appropriate draw-off cocks, gaugecocks, safety valves, &c.; a copper perforated steam pipe runs round the bottom of the boiler, on the top of which is a pipe containing a tube, which has a copper receiver at the top end; to the receiver is fixed a pipe, in a slanting direction downwards.

A tank, with a cover and false perforated bottom, is placed between the height of the boiler and the receiver, and communicates with the boiler by a pipe. The tank is filled with the substance to be operated upon (say logwood), the false bottom of the tank having been previously covered with a cloth or wire gauze; cold water is then poured on the logwood, and the cock in the communicating pipe being opened, the water runs into the boiler; when it receives the proper heat, the steam valve is opened, and the water forced up the tube, at the top of the boiler, into the copper receiver, and from thence, by the slanting pipe, into the tank again, on the same, or fresh logwood; from the tank it flows again into the boiler, and this is repeated until the required strength of liquid is obtained.

Above the tank is a vat, containing a worm or any other proper condenser. The tank being covered, when the hot liquid enters, the steam is conveyed by a pipe from the tank to the condenser, and returning in its condensed state, by the same pipe, mixes with the liquid which is flowing into the boiler.

The concentrating is performed in the following manner:—The whole of the color, tannin, &c., contained in a substance, may be extracted in the manner described, if a sufficient quantity of liquid be employed; and if the liquid be not of sufficient strength, it must be precipitated by chemical means, according to the matter employed. For logwood, put the liquid into a tank, and add sugar of lead, in the proper quantity to make the liquid of a clear straw color, it may then be pumped gently off, and to the sediment add 2½ ounces of liquidated sulphuric acid, with an equal quantity of water, and the whole of the color will be procured in the form of a thick red paste.

Claim first.—Mode of extracting color, tannin, &c., by causing the water to rise or flow over, by the means of steam or heated air being introduced under the matter in operation.

Second.—By using a pump, for getting the liquid from the boiler.

Third.—The application of the condenser, as described.

Fourth.—The mode of treating the extracts so as to set the coloring matter free.

ENTERED AT THE PETTY BAG OFFICE.

(Continued from No. 59.)

Joseph Atkinson, of Round Hill, near Masham, York, farmer, *improvements in threshing and winnowing machines*, Sept. 7.—The wheat to be threshed is fed in at an opening at the top of the machine, and passed between a revolving cylinder or drum, furnished with rows of pegs or spikes, and a segmental covering, the interior of which is also furnished with a series of oblique spikes, which cause the ears to be stripped, and the grain shaken out, and passing thence down an inclined plane, the grain, chaff, and straw are received upon a segmental sieve, the meshes of which are sufficiently large to permit the grain and chaff to fall through. The accumulated straw is taken up, and discharged through an aperture in the frame by a rotary rake, composed of four arms, furnished on their outer edges with blunt teeth. The grain and chaff, in their descent from the sieve, are brought under the action of a powerful and rapidly revolving fan, or blowing apparatus, by which the chaff is entirely removed, and the grain passes on into oblique shoots below, where it is received in its finished state.

The whole is set in motion at once by a wheel, on the axis of the winch-handle, connected with pinions. The inventor claims the application of the revolving drum and segmental covering, furnished with pegs or spikes; likewise the arrangement and distribution of the rotary rake and blowing apparatus.

NOTICE.

*** *The Specifications due, in last week's number, (from Oct. 13 to Oct. 16), were given by mistake; they will be inserted in the* "Inventors' Advocate," *of Oct. 24.*

FOREIGN INTELLIGENCE.

BELGIUM.

The *Fanal* continues to publish the terrors of the preparations of England for destroying her enemies. In a recent number we are favored with an account of a new kind of rocket, which, it would appear, has been invented and constructed at Woolwich, and which will deal out destruction at a distance of six miles. This rocket is called the *Blum*-rocket, from the name of the inventor. The correspondent of the *Fanal*, who furnishes these wonderful accounts of our warlike preparations, says he had the description of this new weapon from a gentleman connected with the arsenal at Woolwich. It is made in the following way: A large Congreve rocket has a smaller one contained within it. This compound rocket is placed in a thirty-six pounder instead of a ball, and is fired off to the distance that a ball would be carried. The fusée of the outer rocket having in the mean time been ignited, it flies off, with its own inherent force, at the end of its first flight from the cannon. The fusée of the smaller one having been also fired, it is propelled by the combustibles with which it is charged at the end of its second flight, and in this manner the projectile is propelled by three distinct forces. These rockets, it is said, are intended to be used, not only in defending our own shores, but in setting fire to the ships and towns of the enemy at a great distance. The Blum-rockets have no stick fastened to them, like other rockets, but a double case of sheet-iron is placed at one end, to steady them in their course, by which means they can be fired from a canuon with the greatest readiness.

A letter from Liege states that two Russian officers belonging to the engineer corps have arrived in that city, to examine the Belgian railroads. Thoy have come from America, where they have been for a year and a half. They are commissioned by the Russian government to make a special report relative to the railroads and steam-boats of England, Belgium, and North America.

The members of the Commission of Inquiry into tho state of the linen manufactures, have returned to Brussels from England. It is said they are much pleased with the manner in which they were everywhere received in England, Scotland, and Ireland.

The Hainault Society of Literature and the Arts has proposed the following subject for a prize:—"To determine the proportions that ought to be observed between the depths of coal-pits, and the length of the working galleries, for the purpose of ascertaining what would be the saving effected by observing that proportion in the different collieries of the province."

The provincial council of West Flanders adopted, in July last, resolutions to encourage the erection of monuments to the memory of distinguished men. The resolutions commence by stating, that the council consider that public honors paid to eminent men excite emulation in the different classes of society, and powerfully assist to strengthen the national spirit. They then proceed to carry this principle into effect, by providing an annual fund for the erection of public monuments to celebrated men born in West Flanders, or who, not having been born there, have formed establishments in the country beneficial to society. The fund thus provided is not for the payment of the total expense of the monuments, but for the purpose of encouraging the erection of them by granting subsidies to those towns which wish to erect statues to the honor of their distinguished townsmen. A commission is appointed for the purpose of deciding which men have been sufficiently distinguished, to be worthy of tho proposed honor.

RAILWAY INTELLIGENCE, DOMESTIC AND FOREIGN.

Manchester and Birmingham Railway.—The whole distance beyond Stockport is now under contract, and the works are in progress. The works upon 23 miles were let at the rate of £13,300 per mile. The rails will cost £4,200, and the land about £3,000 per mile. The works are to be completed, fit for opening, in the early part of March, 1842. The rails were contracted for on Thursday, at less than £10 per ton, delivered on the line. At the present rate of discount, this undertaking must surely be a profitable one.—*Railway Magazine.*

Manchester and Leeds Railway.—A correspondent of the *Manchester Guardian*, of Saturday week, states, that lately "a friend of his travelled in one of the 'stand-up' carriages on the Manchester and Leeds Railway, *in company with two respectable well-dressed females, several mechanics, and two pigs!*" Our contemporary attempts to justify this

arrangement, on the grouud that "if people will travel in the lowest class of carriages, they have no right to be particularly squeamish as to their fellow travellers;" but surely a decent respect ought to he paid to the feelings of the poorer class of passengers, of whom the majority of travellers on the Manchester and Leeds line consists.—*Railway Times.*

Cambridge and Norwich Railway.—This line, which is to go from Bishop Stortford to Cambridge, and thence to Norwich, is now making way, the support of the leading bankers, and influential men of all parties, having heen obtained.—*Railway Magazine.*

Railway to Macclesfield.—The Birmingham and Manchester Company have determined to completo this branch without loss of time, and there is reason to expect that it will he opened simultaneously with the main line to Crewe. When the Bramhall contract (6½ miles) and the Macclesfield contract (3¼ miles) are taken, the whole of the company's contracts will be completed. The distance from Macclesfield to Mauchester by the railway will be reduced to about 16½ miles.—*Chester Paper.*

It is understood that the Stockton and Hartlepool Railway will be ready for opening early in October.

Northern and Eastern Railway.—The line of the Northern and Eastern Railway, which is now completed to Broxhourne, in Hertfordshire, was on Tuesday opened to the public to that station: In the course of the day, several trains performed the journey between the Broxbourne and London *termini.* The trains traversed the distance at a tolerably good pace. The London *terminus* of the Northern and Eastern Railway is at Shoreditch, on the right hand side of the street. The commencement of the line of the Northern and Eastern Railway, is along the rail of the Eastern Counties Railway until it comes abreast of Stratford, when it diverges to the left, and goes over a country perfectly flat, until it arrives at the terminus at Broxbourne. It passes close to the Lea-bridge-road to Tottenham, to Edmonton, to Ponder's-eud, and to Waltham, at all which places there are stations. By the opening of this line of railroad, the journey to Cambridge will he shortened, and all persons travelling on business or pleasure into the north and eastern parts of England, will he expedited on their jouruey; the rail will, eventually, it is said, he carried to York. One great advantage of this railroad is the equality of the ground traversed. The gradients, as yet, are very trifling, in that a uniformity of pace is kept up, and, as there is no tunnelling, people are neither smothered with vapor nor stifled with smoke.—*Times.*

Opening of Cave-hill Railway.—A considerable number of persons assemhled on Tuesday, to witness the opening of the Cave-hill railway, when, we regret to say, an accident occurred, in consequence of the end of oue of tho wagons having given way, and consequently they, with eight men upon them, set off at a fearful rate down the inelined plane and along the line for a considerable distance, when they ran off the rails, and precipitated the men with fearful force on the road. On inquiry at the infirmary, it appears that one man received a concussion of the hrain, and another has had his leg broken; still, however, under the circumstances, it is almost miraculous a much greater amount of injury was not sustained.—*Belfast Chronicle.*

Gosport Branch Railway.—The whole of the land required for the Gosport Branch of the London and South Western Railway having heen purchased, the contractors are now busily employed along this part of the line; and notwithstanding the delay occasioned hy the late accident in the tunnel near Fareham, it is confidently stated that the whole of the work will be coupleted, and the railway opened to the public, on the 1st May next, the time originally fixed on.

Since the commencement of our railway we are continually hearing of depredations being committed in our town or neighborhood. On Monday night, the White Hart public-house, in the Stoke Road, was broken into, and various articles stolen therefrom. On the same night, a copper was stolen from one of the uninhabited houses at Spring Gardens, close to the railway terminus; and on Wednesday night, the Gosport Branch Bank, situate in the High-street, was broken into, but fortunately the money heing always removed in the evening to the residence of one of the directors, the thieves were disappointed in their expected booty. From the public situation of the bank, and the considerable time it must havo taken the parties to break open tho house (aud which was done by forcing out one of the frout shutters, breaking a pane of glass, and then opening the window), and examine the desk and drawers, it seems to us surprising that neither of our policemen should have discovered the burglary.—*Hampshire Independent.*

London and Brighton Railway.—The railway trains from London will come as far as the cutting in Hooley-lane, at the northern entrance to the Merstham tunnel. Passengers and luggage will then be transferred to the stage-coaches, which, after running two miles on the turnpike-road in a direction parallel to the tunnel (the works in which are rapidly progressing), will be placed on trucks and propelled by the locomotive engines as far as Crawley. Horses will then be attached to the coaches, which will proceed to Brighton by the turnpike-road, reducing the length of the journey between London and Brighton to four hours. By this arrangement also, the passengers will be but once shifted—an inconvenience, we admit, but one of a very slight nature, and not greater than that which exists in London from the transfer of passengers and luggage from the branch coaches running to the Elephant and Castle and other places. The works throughout the remainder of the line are going on in a highly satisfactory manner. At the Brighton terminus, the tunnel running from the New England cutting to the site of the intended warehouses at the bottom part of the terminus, in order that the carriage of coals and other merchandise may be kept entirely distinct from the passenger trains, has been completed; and the rails are now in course of beiug laid on the adjoining portion of the London line. Preparations are also making for the erection of the permanent station, which is to be on a magnificent scale.—*Brighton Gazette.*

Birmingham and Gloucester Railway.—Tomorrow, this railway will be further opened to Crofton Farm, within eight miles of Birmingham. In this portion of the line occurs an inclined plane, which we are glad to find the company intend to work upon a system affording the best possible security. At the upper termination of the plane, a confidential person will reside; he will always accompany the train along the plane, the engineers and guards heing under his orders; so that, in fact, he will act with regard to the train just as a pilot does in hringing a vessel into port; it will he under his absolute control. This precaution has been taken, hecause the directors consider it their first duty to do everything to assure the safety and comfort of their passengers; and the publie will appreciate their care. Though this part of the line can be worked with the utmost ease (for the train can, if needful, be stopped by means of trucks at any part of the descent), the directors are quite right in meeting, as far as possible, even the needless anxiety of some persous.—*Worcester Journal,* of Wednesday.

Grand Junction Railway.—On Thursday last, the second class stations at Bridgford, and at Coppenhall were closed, the trains ceasing on that day to stop at them. The public will, we think, be much surprised to learn that the fares on this railway were on the same day increased. The fare, in the first class carriages, between Liverpool, or Manchester, and Birmingham, is raised from £1 1s. to £1 3s.; in the second class carriages, from 17s. to 18s.; from other stations, the increase is in the same proportion. This is the second advance that has taken place in the fares since the opening of the railway, We think the step an unjust one towards the public, considering the monopoly enjoyed by the railway proprietors, and exceedingly doubt its policy with regard to the interests of the shareholders. We wonder that the directors do not, in a business-like way, apprise the public of the changes they from time to time make respecting fares, stations, periods of arrival and departure, &c., by advertisements in the public papers.—*Derby Mercury.*

North Eastern Railway.—Another Accident.—On Friday afternoon last, as a man named James Nicholls, a workman on the North Eastern Counties Railway, was riding on a truck used for conveying dirt from one place to another, and which, with several other vehicles, was being drawn by an engine at the time, he suddenly fell off on the line, and the train, but not the engine, passed over his hody, inflictiug such severe internal injuries, that he now lies at the London Hospital, Mile-end-road, in a very precarious state.—*Times.*

Dreadful Accident on the North Midland Railway.—Chesterfield, Sept. 14.—A terrific accidcnt took place on the North Midland Railway on Sunday last. The train which leaves Chesterfield at 11 o'clock, had got as far as Bull-bridge, on its way to Derhy, when the axletree of ono of the carriages suddenly broke, through the extreme badness of the iron it was made of. Seven carriages were precipitated off the rails, and all of them more or less injured. One gentleman, a foreigner, was killed on the spot, and was sleeping when tho catastrophe occurred. His body was seen on the rails, and a carriage was on his back. He had with him some game, and plenty of cash on his person, besides a valuable pocket-book. He is supposed to have been shooting in the north—we have not yet heard his name. The guard, a remarkably fine-looking man, was precipitated down an emhankment seven yards deep, where he lay for dead; he was taken up breathing, but died last night. Another person (name unknown) is so seriously injured, that he is not expected to recover. A respectable young woman had her collar-bone broken, and her brother had so contused an arm, that the surgeon says it must bo amputated. An aged female, of Chesterfield, was so injured, as not to be likely to recover. She has no bones broken, hut a dreadful internal hemorrhage. It would be difficult to enumerate all the broken limbs, and severe contusions—they are so numerous. Mr. Stephenson himself was a passenger, but escaped unhurt.—*Times* of Tuesday.

Another Accident on the Eastern Counties Railway.—On Monday evening, between the hours of four and five o'clock, an accident occurred on the ahove railway, by which four of the passengers by one of the trains were thrown out, and received such injuries, that two of them are in a state of the greatest danger.

It appears that the Romford train left the terminus iu Shoreditch at about four o'clock in the afternoon, stopping on its way at the station in Devonshire-street, Mile-end, where, having taken in passeugers, it proceeded on its journey. Five or six minutes after the above train left Shoreditch, on of the Stratford trains started from the samo place, and it appears on the same line of rails. This train, it is stated, was behiud its time, and the engineer, in consequence, put on additional speed; indeed, to such an extent, that on its reaching Old Ford, near Bow, Middlesex, it came up with the Romford train, which, as before stated, had left London a few minutes before, and was not proceeding at so fast a rate as the one behind it. The engineer of the Stratford train, being unable at the moment to check the power of the steam, or, at any rate, not in time to prevent a collision, the engine ran with great violence against the carriages of the Romford train, literally dashing one of the third class open vehicles to atoms. Four of the passengers, who were seated in the third class carriage, were thrown out with considerable force on

the line, three of whom were found to be in a senseless condition—the fourth was not so much hurt. The two who were seriously injured were conveyed to the London Hospital, Mile-end-road, and the other two remained at one of the railway stations for three or four hours, but, not being much hurt, at the end of that time were able to walk home. The names of the unfortunate sufferers who lie in the hospital are—James Mason, a mechanic, living at No. 7, Abbey-street, Bethnal-green, broken leg and dislocated shoulder; and John Perry, an elderly man, living at the Grapes public-house, Vine-court, Union-street, Spital-fields, head and face cut open, and right leg fractured.—*Sun.*

Bordeaux Railway.—The works on the railway from Bordeaux to the Teste, are proceeding with the greatest activity. This means of communication would increase in importance in case of war, and if, as in 1812, the mouth of the Garonne were to be blockaded, in that case the trade of Bordeaux would be obliged to be carried on by means of the Teste; the blockade of which could not be effected by an enemy's fleet, without the greatest dangers. In three months, this railroad will, in all probability, be in operation; at least between the Testo and Pessac. An opinion may be formed of the great anxiety with which the completion of this railway is looked forward to, from the number of travellers who, notwithstanding the badness of the present roads, have recently travelled that way. It is true, there has been a new sight to attract visitors in that direction. The navigable canal which crosses the plain of Cazeaux, and the trenches made for irrigating the land, have been recently filled with water. By this means, one of the most extensive systems of irrigation in the world has been formed, and put in operation. Currents of water flow in full channels in large trenches, through lands laid out in varied cultures, and immense plantations, which, together with a number of habitations, now cover this plain, which was lately a desert, where nothing was to be seen but wild heaths.

Railways in France.—The annexed decree, which describes the nature of the interference of the French Government in railway undertakings, must be interesting to most of those who are connected with the English railways, and with this view, we print it:—

Louis Philippe, King of the French.

Know all to whom these presents shall come, greeting:

That we have proposed, the Chambers have adopted, we have ordered, and do order as follows:—

Article 1. The offer made by Messrs. Charles Laffitte and Messrs. Blount and Co., to execute at their risk, cost, and peril, an iron railway from Paris to Rouen, is accepted.

In consequence all the clauses and conditions of the charges decreed on the 22d of May, 1840, by the Secretary of State of Public Works, and accepted on the 23d of May by the said Charles Laffitte and Edward Blount and Co., will receive full and entire execution.

Art. 2. The Minister of Public Works is authorised to accord, in the name of the state, to the company, for the construction of an iron railway from Paris to Rouen, a loan of 14,000,000f. This sum to be exclusively employed in the construction of an iron railway and the purchase of materials for the necessary works to carry it out.

Art. 3. The said sum of 14,000,000f. shall not be paid up till after the realisation and employment of a sum of 36,000,000f. at least; the instalments to be paid by sevenths, in such order as the progress of the works shall require, each instalment to be regulated according to the expenses necessary.

Art. 4. The rate of interest shall be three per cent. per annum. The reimbursement shall be effected year by year in 30th parts, and shall not commence till three years after the period fixed for the completion of the said iron railway.

Art. 5. The company shall pledge for payment for the interest and the sum advanced, the iron railway and all its appurtenances, the materials used in the working, whatever they may be, at any period of the enterprise. In case the company should fail in the stipulated payments, the Government, independently of the right resulting from the preceding article, is empowered to receive the revenues of the iron railway.

Art. 6. In case afterwards another company shall offer to execute at their cost the continuation of the iron railway from Paris to Rouen, even to Havre, as in this case the continuation would be executed at the cost of the state, the iron railway company from Paris to Rouen shall be held to execute at their cost, and out of their common profits, that part comprised between the branch point upon the line from Paris to Rouen, and the bounds of the commune of Rouen towards Deville, in a manner that the two railways shall form one continuous line. In this case the Minister of Public Works shall authorise and grant in the name of the state an additional loan of 4,000,000f. The loan shall be subjected to the conditions stipulated in articles 4 and 5.

Art. 7. The contracts to pass between the state and the company for the carrying out the present law shall be regulated by royal ordinances. These contracts shall fully show the mortgage upon the iron railway, upon all its appurtenances, and upon all the materials for working. The mortgage deeds shall be made in the name of the judicial treasury agent.

Art. 8. The acts to pass in virtue of the present law shall not be passable but with a fixed duty of 4f.

Art. 9. The contractors shall not distribute shares, or promises of negotiable shares, to assist in the cost of the construction of the iron railway from Paris to Rouen, until constituted a society duly authorised, conformably to the 37th article of the Code of Commerce.

Art. 10. From the regulations of the public administration, rendered after the contractors shall have been heard, shall be determined the measures and orders necessary for the police, security, usage, and preservation of the iron railway and all its dependent works. The expenses arising from the carrying out of these measures and of their disposal will be defrayed by the contractors. The contractors shall be authorised to make, under the approbation of the Administration, regulations which they may think necessary for the working and completion of the iron railway.

Art. 11. Provision shall be made for the advances authorised by the present law upon the extraordinary resources designed to meet the expenses comprised in the second section of the budget of the Minister of Public Works. The present law, deliberated and adopted by the Chamber of Peers and by the Chamber of Deputies, and sanctioned by us this day, shall be executed as a law of the state.

Given in command to our courts and tribunals, prefects, administrative bodies, and all others, that these presents they will protect and maintain, will keep them protected, observed, and maintained, and, to render them more public to all, will make them public, and register them with all necessary care, and in confirmation thereof we have hereunto put our seal.

French Opinion of English Railways.—(From the *Leeds Mercury.*)—The following extract from a letter written by Mons. Chas. Sallandrouze, member of the French Council General of Manufactures, and communicated to the *Album de la Creuse*, may not be uninteresting at this moment, demonstrating as it does the high opinion that scientific gentlemen entertain of our railways in general, and of the *North Midland* in particular. M. Sallandrouze writes as follows from England:—"London, Wednesday.—Although two nights have elapsed since I slept, I could not decide upon taking any repose till I had given you the details of my fabulous voyage. 'Fabulous' I may say, for its rapidity partakes of the marvellous.—Monday I announced to you from London my projected excursion; Tuesday I wrote to you from Leeds, I had completed ninety leagues [a French league is about two miles and a half]; and this morning (Wednesday) I have returned, after having seen Derby, Manchester, Leeds, Birmingham, visited a cloth manufactory, another of machines, a cotton mill, a flax mill, travelled two hundred leagues, and passed but *one* day out of London!—At present, in England the fairy ring of the Arabian Nights has become almost useless. But to resume. On Monday I arrived at Euston Square as the clock was striking five, and the bell sounding for departure. My friends were at the carriage, and had begun to despair of my arriving in time. I cannot describe to you the apparent tumult and hurry, notwithstanding at the order, which reigned this moment: 200 or 300 persons precipitated themselves into carriages; the horses neighed and struggled, while they were being fastened in stables admirably constructed to save them from any harm; private carriages were placed like magic on to platforms; then all darted off, preceded by a machine, which carried them along with the rapidity of lightning. I could not help thinking then of poor France, which, if it does not make haste, will find itself out of the world, while all that surrounds it is on the road of progression. The railway from London to Leeds, through Northamptonshire, Warwickshire, and Derbyshire, is something wonderful; the English have played with obstacles in the most surprising manner. Sometimes the road runs through immense tunnels for leagues under ground; sometimes on narrow ways suspended over the valley. Here it passes under a canal, and above this canal is placed a bridge; in fact, there are three roads one over the other,—the road of fire, the road of water, and the road of earth; and, notwithstanding, each is animated; the canals are covered with boats which carry merchandise at a low price; the road alive with coaches and travellers; the railway every hour sends forth immense trains apparently carrying entire populations. How to explain, then, this prodigious activity of execution with the slowness of decision that characterises the English! Truly England is the country of contrasts. The more one examines, the more one sees how much time and care it demands to appreciate!" [The inquiring traveller, on his arrival at Leeds, visits the manufactory for the newly-invented cloth, but expresses his opinion against the probability of its applying to fine cloths, although he says it may be extended to the heavier description of goods *ad infinitum.* He then proceeds to a machine manufactory, and afterwards to the factory of Mr. Brown, of the ingenuity of the processes in which, as well as of the talent and urbanity of Mr. Brown, jun., he speaks in the warmest terms.]—"At six o'clock," he continues, "I returned to my hotel, after having seen the wonder of Leeds, the manufactory of Mr. Marshall." [Dining at seven o'clock, he proceeded by the eight o'clock mail to Manchester, where he visited a cotton-spinning mill, and quitted for Birmingham, arriving at six o'clock in the morning. After walking about the town, he started for London, and arrived there at ten o'clock. Continuing his remarks, he proceeded to describe the present position of railways in England.] "Examine," says he, "the map, and you see Liverpool joined to London, thus connecting the great port of the south-east with the great port of the north-west. Then London and York, the two great cities of the north and south, are brought together by the same link that includes Hull, the greatest exporting port for the north seas. London, he adds, is joined to Havre by the Southampton, and let us hope some day to include Paris. Newcastle and Maryport will shortly bring the great district of coal to the manufacturing districts; and last, the *Great Western* joins the Atlantic to the North Sea through its two principal ports."

To the Editor of the "*Inventors' Advocate.*"

Sir,—On most railways, different modes have been adopted in laying the rails, and in securing and supporting the same; varying either according

to the fancy of the engineer, or the facilities of obtaining the different materials requisite in the localities through which the railway passes. On some, the rails have been supported by stone blocks, placed at certain distances apart; on others by transverse wood sleepers, also at intermediate distances; to either of which, iron chains are fixed to carry and secure the rail, forming of course an interrupted bearing. Both of these plans have been found detrimental, as, from the great weight of the engine and train, the intermediate spaces between the supports have been depressed (the rail being of malleable iron), and have caused a series of undulations extremely annoying to passengers, and must be injurious to the machinery of the engine, producing a much greater strain on the springs and axles of the carriages. To obviate this, a longitudinal sleeper of timber has been used by Mr. Brunel on the Great Western, which, besides the advantage of an uniform pressure on the earth, forms a continuous bearing for the rail, and has prevented that unpleasant jolting so much complained of, where stone blocks or transverse sleepers have been used.

Another advantage obtained by this plan, is, the saving of a considerable expense in chairs. This system, however excellent, has not been followed by every engineer,—perhaps from a desire of trying some mode of his own, rather than to become the copyist of another.

One line of railway I wish to call attention to, on which both systems are united; with what advantage, I am totally unable to point out. I mean the Birmingham and Gloucester Railway, where, although longitudinal sleepers are laid, yet in place of the rail being screwed or spiked on the timber, as previously practised, and thereby forming one continuous support, the absurd plan of using chairs is adopted, destroying the great principle of a continuous bearing. Besides the expense attending the use of them, the rail requires to be much heavier; it being a well known fact that, where a weight is to be supported between two points at a distance from each other, the beam or rail supporting the same requires to be stronger than that where every inch of it has a bearing. In laying the longitudinals, the workmen, in place of rendering the bed level and hard, previously, pack up with ballast at different points, which deprives the timber of that uniform bearing so essentially requisite to a well constructed railway. The ties used for connecting the longitudinals, and preserving the gauge, are cut or notched down to (in many instances) less than two inches in thickness, which is so very slight, that I have little doubt when the line shall be in full work, accidents arising from the kanting of the sleepers and consequent derangement of the parallel will be the result.

Should I have made any assertion in this letter which cannot be maintained, no doubt some person connected with the line in question will be able to refute the same, and explain the peculiar advantages expected to be derived from the modes adopted. I am, Sir,

Your's obediently,

PYRO.

RAILWAY ACCIDENTS.

The following letters, which deserve serious attention, appeared on Tuesday, addressed to the Editor of the '*Times*':—

Sir,—In your paper of to-day are accounts of two dreadful events—"accidents" (by courtesy) on the North Midland and Eastern Counties Railways, one attended with instant loss of life and broken limbs and contusions, which the writer says "it would be difficult to enumerate;" the other with only broken limbs and one person "not expected to recover." Bad as this account is, it is certain that, had a second engine, in either of these cases, been placed behind the train to assist, in fact to push it on, the mischief must have been fearfully increased, and your pages would have had to chronicle, not the passengers killed or wounded, but the passengers saved—all others, the great majority, being killed. Now this dangerous practice is in daily use on the London and Croydon Railway, and, I believe, on no other railway. I often read of trains being drawn by two or more engines "ahead." I have lately seen accounts of five engines "ahead." But its use by another railway would be no justification of any dangerous practice. I am told that the London and Birmingham Railway Company have long since discontinued the use of an engine behind,—an "accident," attended with injury, but not with death, having been caused by an engine pushing a train forward. An axle-tree may break upon the Croydon Railway, as one has broken upon the North Midland; but something far less than this, in short, any accident occurring to any carriage, even the last, would inevitably cause the passengers not merely to be thrown off the line (the favorite phrase), but to be crushed between the two engines. When assistance is wanted, there ought to be no difficulty in putting, as on other lines, both engines "ahead." Precautionary measures are better than remedial, and cost less in life as well as in money, although the latter alone affects the dividends. The railway system pervades the country, and whilst no one disputes its benefits, its abuses must not be passed over; it must not be allowed, as an European Juggernaut, to be propitiated by its chariot wheels being steeped in blood. Rules may be made too late. On the Croydon Railway the system of forcing, called "helping," passengers into the trains whilst moving, although continually remonstrated against, was not abandoned until an unfortunate passenger was thus killed "by accident," and the coroner's jury very properly blamed the system. In the hope that, by your aid, the practice of which I complain may either be changed or justified,—I am, Sir, your constant reader, and

A DAILY PASSENGER BY THE CROYDON RAILWAY.
September 16, 1840.

Sir,—The accounts of the two frightful accidents in your paper of this morning, have induced me to submit a few observations on the construction of the carriages generally in use on railways, scarcely any improvements in them having taken place since those first built for the Liverpool and Manchester line. In the year 1835 I had the management of the London and Greenwich Railway, where the carriages being on the same high construction, an accident occurred similar to that on the Eastern Counties, attended also with loss of life; many passengers were severely bruised, and the whole train of carriages nearly thrown over the parapet wall. As much responsibility rested on me, I did not hesitate one moment in adopting a plan by which no passengers have since been injured; although the wheels and axles have been often broken, and the wheels run off the rails, seven or eight millions of passengers have travelled unhurt. The plan was to abase the centre of gravity below the axles, and suspend the carriage body on a strong frame, within four or five inches of the rail, so that the moment any accident happened to drag the wheels off the rail, the beams form a sledge, and the only perceptible difference to the passengers in the carriages is that of a sliding instead of a revolving motion, until the train is stopped. The engines are also secured from running over a parapet, or an embankment, by similar beams. The carriages have the same height of wheels, although they are 2½ feet lower than when originally constructed. It entirely prevents all rocking motion, and, from the proximity to the ground, atmospheric pressure, which on an elevated embankment or viaduct either nearly altogether retards a train, or impels it to a dangerous degree, is prevented. Although the carriages on the Greenwich Railway are not kept in a very clean or respectable state, they afford, nevertheless, perfect safety to the passengers.

I am, Sir, your obedient servant,

GEORGE WALTER,
Late Resident Director of the London and Greenwich Railway.

ERECTION OF A BEACON ON "GOODWIN SANDS."

The task undertaken by Captain Bullock, of Her Majesty's steamer Boxer, of erecting a safety beacon on the Goodwin Sands, about seven miles from the town of Deal, has been successfully accomplished, by which it is hoped to avert the dreadful loss of life by shipwreck, which has so frequently occurred in that part of the British Channel. To the high credit of Captain Bullock, this desirable object was accomplished on Thursday the 10th inst., under his superintendence and that of Captain Boys, superintendent of the naval store department of Deal. Captain Bullock has been long engaged in carrying out the above object, and in the arduous duty of correcting the charts in various parts of the globe, and is now doing so under the authority of Government in the waters of England. He commenced at Westminster-bridge, and proceeded towards the Land's-end, which is at present undergoing his survey. The beacon he has succeeded in erecting, consists of a column about 40 feet above the level of the sea, having cleets and ropes attached to four of its sides, with holds for hands and feet. At the summit of the column is attached a gallery of hexagon form, made of trollis work, and capable of holding 20 persons at one time. Above the gallery, and in continuation of the column, is a flagstaff 10 feet long, thus making the entire beacon 50 feet in height. The sides of the gallery are so constructed as to enable the persons in it to be covered in with sailcloth, which is reefed in and round it, and can be used at pleasure; as also an awning to pass over it, which is fixed to the flagstaff; thus entirely protecting any unfortunate mariner who may seek shelter on the column from foul and tempestuous weather. A barrel of fresh water, together with a painted bag enclosing a flag of distress, is stationed on the gallery, and the words, "hoist the flag," painted in the languages of all nations on boards stationed round the inner part of the gallery, so that the foreigner as well as native seaman may be enabled to show a signal of distress, and obtain help from shore, which is about seven miles distant from the beacon. The means by which the beacon has been erected in so extraordinary a place as the Goodwin Sands, are as follows:—The foundation of the column is several feet below the surface of the sand, and is secured in the centre of a stout oak platform, extending from it on either side several yards. This is secured by upwards of two tons of pig-iron ballast being lashed to it. In addition to this, eight stout iron bars, each six feet long, are driven obliquely on each quarter of the column, and two also put at a distance of 12 feet on each quarter, and chains attached to them, communicating with the upper part of the column and the gallery. The sands for three or four hours during the tides are high and dry, and presents a fine tract of level extending for several miles. Great numbers of visitors from Ramsgate and Deal attended the erection of this tribute to humanity. The first person to mount it was Lieutenant G. C. Boyes, a young and intrepid officer, who, on reaching the summit, hoisted his handkerchief, a fac simile to a union jack. The indefatigable exertions of Captain Bullock, Captain Boyes, Lieutenants Gull and Bowes, and the other officers and men engaged in the undertaking, are deserving of the highest praise, tho', being compelled to work for several hours up to their knees in water. Several visitors afterwards ascended the column, and testified in the strongest terms their approbation of this stupendous work for the benefit of humanity.

GRATUITOUS COPIES

of our Journal have been forwarded to a number of Individuals interested in some Patent, or Invention, of which notice has been taken in our number of to-day.

TO CORRESPONDENTS.

We shall, at all times, be ready to ANSWER QUESTIONS *that may be put to us, relative to any of the subjects indicated in our title; and questions put during the current week, will be replied to either the same, or following week.*

"THE INVENTORS' ADVOCATE, *and* JOURNAL OF INDUSTRY," *may be forwarded,* postage-free, *to all the undermentioned places:—*

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'THE INVENTORS' ADVOCATE" *is published every* SATURDAY MORNING, *at* 7 O'CLOCK; *if, therefore, our Subscribers do not receive their copies* regularly *from their Newsmen, the fault never rests with* US.

For the convenience of persons residing in REMOTE PLACES, *the* "INVENTORS' ADVOCATE," *will be regularly issued in* MONTHLY PARTS, *stitched in a handsome wrapper.* PARTS 1 *to* 15, ARE NOW READY.

ADVERTISEMENTS *should be sent in not later than* Thursday Evening.

TWO *numbers of the* "INVENTORS' ADVOCATE" *(Nos.* 48 *and* 49*) were published* July 4. *The former contains, in addition to the usual varied matter, the* TITLE PAGE *and a* COPIOUS INDEX *to the* SECOND VOLUME.

VOLUME II. *of the* "INVENTORS' ADVOCATE," *handsomely bound, is* NOW READY. *A* FEW COPIES *of the* FIRST VOLUME *still remain on hand.*

"A. J."—*Our Correspondent's letter is so unreasonably long, that we cannot possibly give it insertion. If reduced* one half, *it shall appear.*

"W. L."—*You may include all the improvements in your specification, if the title of the invention will cover them.*

"A Constant Reader."—*We cannot allow our paper to be made the medium of an attack upon any private individual, connected with a public company. The proceedings will be reported in the regular way.*

TO INVENTORS.

ALL PERSONS who may be desirous of TAKING OUT PATENTS, or of bringing VALUABLE INVENTIONS into USE, are requested to APPLY to the PROPRIETORS of "THE INVENTORS' ADVOCATE," (DELIANSON CLARK & CO.) at their "PATENT AGENCY OFFICE, FOR ALL COUNTRIES," 39, CHANCERY LANE, where they may be consulted, daily, relative to the PATENT LAWS of GREAT BRITAIN, and ALL OTHER STATES.—(See ADVERTISEMENT on the last page of the present Number.)

THE
INVENTORS' ADVOCATE,
AND
JOURNAL OF INDUSTRY.

SATURDAY, SEPT. 19, 1840.

The harvest in England is now nearly completed. The reports received of the state of the crops are generally very favorable; and if the produce will not be abundant, it will be at least equal to the quantity usually supplied from our own resources. Though the weather during the greater part of the harvest-time has been as fine as could be desired, and notwithstanding the reports from the country represented the garnered wheat to be in excellent condition, still the price in the markets which regulate the importation of foreign corn, continued to rise. At the end of August, indeed, the corn averages were higher than at any time during the present year, though every one who bears in mind the comparative prospects of our own produce in the spring, and in that month, must be aware that the advance in price could not have been the result of fair trading transactions, regulated by the probable supply.

During the early part of the year, every thing looked as unpromising as possible for agricultural operations. The unusually long-continued rains first threatened to destroy all the seed in the ground; and the subsequently long-continued and unusually dry weather, threatened to be equally prejudicial to the growing crops. During these gloomy indications, the price of wheat did indeed advance, and kept advancing until May; when the favorable change of weather having revived the hopes of the farmers, and the damage previously sustained not having been so great as apprehended, the markets declined, and continued to do so until the harvest commenced. Then, in opposition to all natural expectations, founded on the auspicious state of the weather, the reported produce of the crops, and the superior condition of the grain, the price of wheat advanced higher and higher. The aggregate average returns of the six weeks, published on the 20th of August, were actually higher than at any one period during the year.

This result was evidently brought about by the corn speculators; who, finding from the state of the harvest, that the price of English wheat must shortly fall, and that the duties on foreign corn would consequently rise, were determined to force up prices to enable them to enter the foreign corn in bond for consumption at the lowest duty. Their operations succeeded, and at all our bonding ports the warehouses have been cleared of foreign wheat on payment of a duty of 2s. 6d. a quarter. We thus perceive that by means of fictitious sales, effected by corn speculators, the principle which the corn law had in view of steadying prices by keeping the supply of foreign corn proportioned to the demand and to the state of home produce, entirely fails in practice; for, during a season of at least an average supply, the English farmers, who object to a fixed protecting duty of 10s. a quarter, find themselves exposed to the competition of foreign-grown corn, admitted at the almost nominal duty of two shillings and sixpence.

These facts ought to be strongly impressed on the minds of those who continue to uphold the variable duty, on the supposition that it affords greater protection to agricultural produce than would be afforded by any fixed duty, short of prohibitive. It is by showing how open the present system is to fraud, and by exhibiting the practical injustice of it to the farmers themselves, that the best hope of effecting a change depends. The principle of the corn laws, we contend, is radically bad, even were it carried out in good faith, because those laws make this country more completely dependent on the weather for the supply of the principal article of food, than it would be if a quantity of corn were regularly grown abroad for the English market. But when, in addition to their own inherent defects, the corn laws have to contend against the fraudulent practices for which it presents temptations, the system becomes doubly obnoxious. Instead of regulating the supply of foreign corn, according to the wants of the country, the corn laws afford no true indication of the quantity required when the great corn law gamblers choose to operate on the market. When it suits their object, they can produce an appearance of scarcity in a season of abundance, and the means of protection on which the agriculturists depend, can be made the instrument of their oppression, by opening

foreign competition at a time they most rely on maintaining a monopoly of the market. The present corn laws serve to foster a species of gambling of the worst kind, in which the stake played for is the food of the people; and those suffer most who take no part in the game.

DIMINUTION OF PRESSURE BY MOTION.

We last week considered pressure in its relation to time, and showed that the amount of force exerted by a body in a given time is the same, whether it be resting on a support, or whether its power be accumulated in falling; the difference of the effects in the two cases being produced by the different modes of applying the same amount of power. We shall now proceed to point out some of the practical effects of this principle, the application of which explains many phenomena that otherwise appear to be perfectly unintelligible.

The throwing of a stone horizontally, is a familiar illustration of the principle that pressure is regulated by time. Suppose, for instance, that a stone were thrown from a height of sixteen feet, with a force that would carry it one hundred feet horizontally in one second. The stone being thus acted upon by the combined forces of gravitation and projection, would at the end of the first second of time be brought to the ground by the former, and would be carried by the latter to a distance of fifty feet horizontally from the point whence its motion commenced. Now it is clear, that the amount of downward pressure of the propelled body is the same, whether it be propelled at the rate of fifty feet in a second, or of five feet, as it is brought to the ground from the same height, in either case, in exactly the same time. But the amount of downward pressure such a body would exert, *at any one point* of its course, would differ materially in the two cases. When the body was propelled at the rate of fifty feet in a second, the downward pressure during that time would be spread over the whole range of fifty feet, and during its more rapid course there would be no more actual weight pressing downwards in the space of ten feet, than in the space of one foot in the other case. In other words, a body when moving horizontally with ten-fold velocity does not, at any one point of its course, weigh more than one-tenth the weight. The *aggregate amount* of weight, or pressure, is equal, but it is in one case distributed over a larger space. The effect is the same as if a leaden weight were rolled out, and the pressure which it previously bore upon one small surface were thus expanded, and made to bear with a diminished intensity upon a greater number of points.

We thus perceive the cause why a heavy body which would break through thin ice, if at rest, can be supported by the same ice when propelled quickly along its surface. For instance, a man may skate safely over a sheet of ice which is much too weak to bear his weight if he be not in motion; because the weight of his body is in the latter case supported on a much larger surface in a given time. The same principle will apply to wheel carriages, and to all bodies moving on hard resisting surfaces. A carriage on a railroad when it is propelled at the rate of fifteen miles an hour, bears as much weight on the fifteen miles of rails as it would on thirty miles of rails were it moving with double the speed. The pressure on the axles would also be equal in an equal space of time; and were the carriage to move at the rate of forty-five or sixty miles an hour, the pressure on the rails and axles would continue the same; and its weight on any given bearing of the line would be reduced to one third or one fourth the amount of pressure on the same bearing when the carriage was moving with the lowest velocity.

It is by thus taking into account the times, or moments, of pressure, that we are enabled to explain some curious phenomena connected with friction. It is a well-established fact, that the amount of friction of wheel carriages in reference to the extent of ground moved over, is much less when they move rapidly than when in slow motion. The pressure on the axles and on the ground being reduced one half when the velocity is doubled, it follows, as a matter of course, that the friction arising from the pressure of surfaces against each other must be thereby greatly diminished, and if the rubbing surfaces were perfectly smooth, and the resistance to motion depended on the weight alone, a double, treble, or quadruple velocity, when once given, could be maintained with the same expenditure of power.

The principle that pressures and resistances have their times of action, is applicable to explain most other phenomena connected with re-action. As we know that a weight does not become heavier by remaining on the same spot, whilst we find, on the other hand, that its pressure is diminished by motion; we must suppose that there is some definite time required for the exertion of its whole pressure; but beyond that time, if the weight be stationary, there is only a repetition of the same effect, which is counteracted by the resisting or opposing force. If, therefore, the motion of a body be more slow than the *moments of pressure*, its whole weight will bear on any point on which it moves; but when the motion becomes more rapid than the moments of pressure, then a portion only of the weight bears on any given point, and the amount of the weight will be in proportion to the velocity.

NEW INVENTIONS.

NEW MODE OF MAKING SULPHURIC ACID.

Hitherto, sulphuric acid has been made solely from sulphur in its simple state, as brought from the sulphur mines. A practical French chemist has, however, discovered the means of making this valuable acid from salts in which sulphur is combined. The advantage of being able to employ sulphates as a substitute for pure sulphur will be very great, for though the price of sulphur at present is not high, yet the recent rupture between England and the Court of Naples, owing to the latter having given to a French company the monopoly of the working of the sulphur mines of Sicily, shows that it is an object of great importance to be enabled to place ourselves in a position independent of foreign supplies in an article so essential for many of our manufactures. This country, and all parts of the continent, abound in sulphate of lime, and other sulphates, though sulphur in its pure state, as is well known, is only to be found in volcanic regions. The supply of it being thus limited, the price is subject to great fluctuations, and the trade being under the control of a few, the supply might, by possibility, be altogether withheld. Independently, however, of this consideration, the effect of the new process of manufacture will, it is said, be to diminish very considerably the cost of production, even at the lowest prices at which sulphur can be procured. The quantity of sulphuric acid contained in many descriptions of gypsum is nearly equal to one-half the weight of the whole mass; therefore it is evident, if means can be found of separating the acid from the lime with which it is combined, in a cheap manner, there is always an abundant and ready supply to be found of that material within our own reach. Many attempts to effect this have been made for some time, but hitherto without success. M. Pelouse, a member of the French Academy of Sciences, thought he had discovered the mode of extracting the sulphuric acid from gypsum, and took out a patent for the discovery, but when it came to be practically applied the process was found to be so expensive, that though it was very ingenious and clever, the manufacture of sulphuric acid by that means would be like the discovery of making silver from gold. The new process, which is noticed in the *Moniteur Industriel*, is not particularly described; but it is stated, that the experiments already made leave no doubt of its success. That journal does not even mention the name of the inventor, but it promises to disclose the name and to describe the process very shortly.

IMPROVEMENTS IN LOOMS FOR WEAVING. BY AMAND DEPLANQUE OF LISLE.

(Communicated by the Inventor.)

The loom, including the frame and Jacquard, is made entirely of iron, wrought, or cast, and has the great advantage of not being influenced by any change in the weather.

The rotary motion of the Jacquard cylinder is

obtained by one toothed wheel catching in another, on the forward movement of the Jacquard cylinder, which movement is produced by a centre piece in connexion with two drivers.

The same centre piece also causes the necessary pressure of the Jacquard cylinder against the horizontal needles, as well as the forward and backward movement of the Jacquard cylinder.

A batten is constructed connected with the cards, which has at each end a vertical wooden sliding, to which are adapted the shuttle boxes, with stops to level them when rising with the plate of the batten. By means of the batten, two or three shuttles may be employed without requiring any extra attention respecting their changing.

On each side of the interior of the machine are fixed two square pieces, on which rest a rectangular triangle, in the middle of which a rod is screwed, fixed by the other end to a lever, of which one end is connected by a string to a hook in the Jacquard, by which hook the triangle is raised, when a small pully slides along the triangle, and determines the rising of the shuttle boxes on one side and the descent on the other side.

The treddles are made to rise and descend by a simple arrangement of levers, connected with hooks, to the upper part of the loom.

On the fixed board of the needles are screwed guides for the hooks; the hooks are disposed in two ranks (of eight each for a satin with eight leaves), one rank for the rising, the other for the descent of the needles.

By the adoption of the mechanism in the interior of the machine, for the extra ornamental threads, the economy of the seven-eighth card is obtained.

By a new arrangement of the whips, this invention gives the facility of weaving cloths of any materials, and of any size or figure. By this arrangement the inventor is enabled to adopt in the interior the mechanism for the extra ornamental threads, which by a simple arrangement are worked by the same mover as the loom, and cease when required, without any extra attention being necessary from the workman, and without disturbing the movement of the loom.

A great economy of workmanship is obtained, one workman being able to survey two or three looms at once.

A loom with extra ornamental threads and changing of shuttles, has a celerity of from seventy to eighty strokes per minute, being able to produce about three times the quantity of cloth a good workman would produce in any given time.

The fabric is extremely regular by means of an eccentric platform, which allows the workman to determine the number of strokes he will give by one-fourth of an inch.

The manufactured cloth passes on a cloth beam, whence it receives a pressure determined by the levers.

Only one picker is required for each side of the batten, either in weaving with two or three shuttles, or only with one. All the movements of the upper part of the loom are obtained by the connecting bar.

A loom with extra ornamental threads and changing shuttles, may be converted into a loom able to weave the figured cloth with one shuttle, and without extra ornamental threads, by simply removing two small pieces of iron that are screwed to the frame.

The eccentric platform gives the movement to the connecting bar, which is fixed to the same axle as the toothed wheel.

The course of the shuttle is determined by the movement of two square cast iron pieces, which describe a quadrant, and give a movement of eight to the left hand, and vice versa, and to which are fixed the picker sticks.

EXPERIMENT ON LARGE GUNS.

On Friday, the 11th inst., a party of the Royal Artillery, commanded by Major Chalmers, proceeded to the proof butt in the Royal Arsenal, Woolwich, at 1 o'clock p.m., for the purpose of trying a plan which has been some time in operation in France, for discharging large pieces of ordnance by a hammer and detonating powder, the present system in the British army being with a portfire, ignited and kept burning until the word of command is given. Sir John May, Colonel Dundas, and Colonel Dancey attended to witness the experiment. The gun selected was a 32-pounder, and the charge each time was 10lbs. of powder in a flannel cartridge, with a 32lb. ball fitted in a wooden cup made flat at the end next the powder. Forty rounds were fired, and the simplicity and certainty with which they were discharged gave great satisfaction. The invention is so simple, and might be so easily applied, that there is every reason to believe it will be universally adopted in the Ordnance department. It consists of a small hammer, with a handle about six inches in length, the whole made of brass, acting in holes made in two small pieces of steel fixed by screws to the right side of the gun. The action is given by pulling a piece of cord six feet long, when the hammer falls on the vent charged with detonating powder with such force as to cause instant and certain ignition. There is a small piece of steel to cover the detonating powder, that it may not become wet in rainy weather, and this is so contrived that it falls back the moment the hammer begins to descend.

MR. TAYLOR'S INVENTION FOR PROPELLING STEAM-VESSELS.

On Wednesday the 9th inst., the Lord Mayor, accompanied by Mr. Benjamin Smith, M.P., Mr. Travers, Mr. Bloxland, Mr. Hoard the chairman of the Navigation Committee, and other gentlemen, and attended by Captain Fisher, the senior harbour-master, made an excursion on the river to witness the effect of Mr. Taylor's invention for propelling steam-vessels. The little steamer Jane, in which his Lordship embarked, is the property of Mr. George Bloxland, late engineer to the Commercial Steam-packet Company, and has been an object of admiration on account of her diminutive size, being only a common whaling-boat, to which Mr. Bloxland some months back applied paddle-wheels, and in which he fixed a steam-engine of rather less than one-horse power. These paddle-wheels, with their cumbrous and unsightly appendages, the paddle-boxes, have been removed, so that the little boat is restored to her original form, excepting the addition of a figure-head and counter-stern; the propeller, which has increased her speed one-third, the power remaining the same, has been introduced, but the steam-engine has not been moved from its original position, a fact that proved to the experimenters the entire applicability of the method to every steam-vessel. His Lordship took water precisely at 2 o'clock from Southwark-bridge pier, and proceeded some way up the river against tide, after which he returned, and proceeded as far as Blackwall, calling on his way at Greenwich Hospital. He then returned against the tide, which was running strong all the time, and on landing at Dyer's-hall Wharf at half-past 5 o'clock expressed the strongest approbation of the genius of the inventor. Throughout the whole of the trip the Jane performed admirably; she was under the most perfect control, and appeared to be steered much more easily than when encumbered with the paddle-wheels; she moved as if by magic, creating no swell in the water, and was not affected by the hubbub occasioned by the rapid transit of the large steamers.

MARSH'S APPARATUS FOR DETECTING ARSENIC.

An article in the *National*, on the means of detecting arsenic by Marsh's apparatus, contains some details that are not without interest as connected with the proceedings in Madame Laffarge's case. It appears that this apparatus is of the most astonishing sensitiveness for the detecting of arsenic in the minutest quantities submitted to its action; so much so, that Mr. Marsh himself, by a modification of his process, has detected the presence of this poison when operating upon only one drop of arsenical solution, containing the one hundred and twentieth part of a grain of arsenic. The principle upon which the apparatus is framed, is this—that hydrogen gas has to be formed in the midst of the matter suspected to contain arsenic; that this gas is to be burnt on coming out of the apparatus; and then that the products of this combustion should be examined. One of the principal properties of arsenic is to form a gaseous combination with hydrogen, of an excessively deleterious nature, called arsenicited hydrogen; it burns in this form just like common gas, and leaves as a residue a brown solid matter, or a sort of metallic soot, which is, in fact, the hydrurate of arsenic. If, after the gas is set on fire, a piece of glass is presented to the flame, the combustion is thereby retarded, and there is deposited on the glass a circular bone of metallic arsenic. In Marsh's apparatus a small glass tube is issued, and on the inflamed gas being admitted into it, there is deposited, if the gas contains any arsenic at all, first, metallic arsenic at the part of the tube in contact with the flame; secondly, white arsenic or arsenical acid a little higher up the tube; thirdly, a strong smell of garlic, the arsenic smell, at the other end of the tube. It is an apparatus of this kind that has been used in the experiments by the chemists at Tulle. Since, however, this method detects arsenic in such exceedingly small quantities, it becomes liable to objections when used in cases of forensic medicine. Thus the zinc employed to make the hydrogen gas may itself contain arsenic, as it nearly always does in small quantities; the sulphuric acid employed for the same purpose may contain arsenic, as the English acid nearly always does; and, in short, the most extreme care is requisite in discriminating as to what source the arsenic comes from, when its presence is detected by the apparatus. When, however, Marsh's method fails in detecting any arsenic at all, it may be taken as a most positive test that there is no arsenic whatever in the substances examined.—*Galignani's Messenger.*

POST-OFFICE AND TELEGRAPHIC COMMUNICATION.

A new system of telegraphic communication is in course of organisation, which, in commercial affairs especially, promises very important results. Its author is Mr. B. L. Watson, of Hull, and his discovery, for so it may with great propriety be called, is the fruit of many years' application and of a very large outlay of money: it will be a disgrace to this age of enterprise if it does not meet with an appropriate reward. Under this project, establishments have already been formed, and others are forming, which, being fixed on some point near to great shipping stations, may anticipate, by some hours perhaps, the notice of arrivals; enable vessels, where it is desired not to enter the port, to pass on with new orders, to obtain pilots, a supply of provisions when wanted, assistance in cases of distress, and other facilities which will naturally occur to every man connected with shipping, when he is told that this communication may take place in fair weather, at a distance of 15 or 20 miles from shore. When a sufficient number of these stations is formed at proper intervals over the whole coast of England, for a small annual subscription, by which the charge of them is proposed to be defrayed, owners of vessels, consignees, underwriters, and mercantile associations will have daily reports sent up of the names of vessels that pass, and the information they bring. They may also transmit instructions to vessels which are expected to pass any of the stations, even to a change of the destination when necessary, or put it in their power to carry to the port to which they are bound any change which may have occurred in the value of articles of commerce after leaving the port of departure.

All this, and much more, is to be accomplished by a code of signals, said to be extremely simple, and of which the commanders of all vessels which are to connect themselves hereafter will have to acquire the proper knowledge, and to provide them-

selves with a set of flags, by no means costly ones, which are to be employed in the communication. Such establishments as those described have existed, it seems, for some years past at Liverpool and at Hull, and it is proposed that telegraphs shall now be erected on the following principal points and headlands round the coast:—St. Abb's-head, Flamborough, North Foreland, the entrances of the Bristol Channel and the Clyde, and on the south coast of Ireland. The Trinity Company have so far countenanced this undertaking as to grant permission to erect telegraphs on the sites of their lands occupied by the lighthouses at Flamborough Head and the North Foreland, where the proper stations have, in fact, been commenced. The reduction of postage, it is obvious, will prove an important element in the completion of these arrangements, which could hardly have gone on at all under the heavy tax which the old rates imposed, and they will thus add another to the numerous benefits derived, in spite even of imperfect management, from that measure. A small subscription of 20s. annually from each vessel, which is to connect itself with these arrangements, with the purchase of a set of flags, makes up the whole expense to be incurred; and the system is already in use to some extent, as it is said, but more particularly in the United States.

Some difficulties will naturally suggest themselves in this as in all our undertakings; but, if proper means are found to pay for constant attention and vigilance, they do not seem to be of a very formidable nature. Though the system of signals is described as very simple, one may imagine that captains of ships will in many instances boggle at them, and with the unsteady motion of a rolling vessel they may not often be able to observe whether their signal is understood or not, but on the whole our impression is, that the discovery is capable of being turned to very useful account immediately, and that it will ultimately add another efficient mode of communication to those which the present age has brought forth. Some qualities there are about it which carry a very rare commendation—viz. that it cannot be made a job of, that it may be patronised to a certain extent at little cost and no risk, and that it will quietly drop of itself if not found to answer the purpose held out.—*Times.*

SCIENTIFIC MEMORANDA, AND NOTES ON ART.

The Diorama.—A new and very splendid painting has just been submitted to public view at the Diorama, having for its subject, "*The Shrine of the Nativity at Bethlehem.*" The artist, M. Renoux, is entitled to most honorable mention, for he has produced a work of art bordering so closely upon reality, that the illusion is all but complete. The changes of light and shade are given with startling effect; and the *ensemble* is such, that a visitor might almost persuade himself he was gazing on the identical spot where our Savior was born. We have no hesitation in affirming, that this is the greatest triumph yet attained here, even by M. Bouton. The detail of the picture is worked out from the following *materiel*:—"The stable is formed in a rock, composed of limestone. The pavement, the altar over the star, the manger, and the pillars, are of white marble, but now become almost black from the smoke of the lamps. The pillars are Roman, and were no doubt employed for other purposes before they were brought here." We should add, that the picture has been painted by M. Renoux, after a drawing made by David Roberts, A.R.A., in his late tour through Syria and the Holy Land. This will be a *guarantee* for its fidelity.

Sub-Cutaneous Surgical Operations.—We mentioned, a short time ago, some extraordinary surgical operations which had been performed in Paris by the sub-cutaneous mode of operating. This plan consists in introducing the instrument through an incision in the skin, and performing the divisions of muscles and tendons without exposing the parts operated on to the action of the air. The most remarkable case that had then occurred was that of M. Doubwistki, a young Russian surgeon, who had twenty-two muscles and tendons cut in his arm for the purpose of restoring the use of the limb and the hand which had become distorted and useless, in consequence of a fall he received two years ago. We gave a notice of this operation at the time it occurred. We see, however, in a recent number of the *Journal des Debats*, a report of an operation of the same kind much more extensive, in which all the four limbs of the patient were operated on, and the number of divisions of muscles, tendons, and ligaments amounted to forty-two; all of which were cut through at one operation. The person upon whom the operation was performed is a young man, twenty-two years of age, of a good family; who, in consequence of a severe fall in his infancy, lost the use of his limbs, and his nervous system received such a shock that he has never gained speech. After having vainly tried every proposed remedy by mechanical means for stretching the limbs, and after having endured the greatest torture in the attempts, he determined, as a last resource, to try the plan of the section of the muscles in the sub-cutaneous method; and he, therefore, placed himself under the care of M. Jules Guêrin, who operated on the young Russian professor. The following is the description of the operation given in the *Journal des Debats*:—

"We were invited to dine at the Dumb Institution with many other medical men; though it may he thought that the sight of a *fine operation* is far from a good preparative for dinner. There were many eminent surgeons present. At five o'clock we assembled, to the number of thirty, round the bed on which the unfortunate man was soon placed in a state of nudity, where he remained incapable of moving a limb. M. Guêrin very shortly told us the history of the patient's life, of his accident, and of the means previously adopted for his cure. After which, without any interruption, and as if he were only about to cut his hair, the operator, with the resolution which conviction and experience alone afford, proceeded to perform the sub-cutaneous section of the muscles, and the tendons of the thighs, legs, and arms, without any hesitation or stopping, and without any tone of complaint from the patient. The total number of muscles and tendons divided at the elbows, the fore parts of the arms, at the knees, and the two feet, were forty-one, and in addition to these operations on the limbs, M. Guêrin divided also the great pectoral muscle in the chest.

"At the division of each tendon we heard a crack, produced by the instrument, as if it had cut the stretched strings of a bass or a harp. It was enough to make one shudder; not that the patient expressed the least complaint, or that the operator exhibited the least hesitation, or that his hand appeared fatigued; his instruments only began to relent, and threatened to refuse to do their office; but it was impossible to avoid thinking that we were witnessing one of those frightful punishments of torture in which the executioner cuts the sinews of a poor victim one after another, until overcome with pain, he acknowleges himself guilty of the crime with which he is charged.

"After the great operation which I have described had been completed, the patient, nearly dislocated, having been removed to his bed, we sat down to table as if nothing had happened; and, I confess it to my shame, we succeeded in making a good dinner. It was not without some anxiety that M. Rayer, and I, stole secretly in the evening to the invalid's chamber, to count the beatings of his pulse, and to ascertain the intensity of his fever. But it appears that our science is vain, and our principles are confounded. The invalid had no more fever than we had; or rather, it was our pulse that was the most agitated. As to him, he *slept* a quiet sleep. We returned the next day for the same purpose, also in vain; for it was impossible to detect the least appearance of an access of fever or inflammation. At present the forty-two wounds are almost healed; the arms and legs are already partially restored to their natural positions, and the invalid has not experienced any acute pain.

"I must not quit this subject without mentioning the young Russian professor, whose muscles and tendons of the fore-arm were divided by M. Guêrin, a short time since. Not the least inconvenience has attended the results of that operation, and M. Doubwistki assisted with us the other day in the operation on the dumb man, being himself almost entirely cured of his lameness.

VARIETIES.

Literature in Prussia.—The King of Prussia has granted to the celebrated poet, Louis Tieck, an annual pension of 4000 thalers (14,000 francs) out of the funds specially appropriated for the encouragement of literature and the arts. The King announced the grant to M. Tieck in an autograph letter written in the most flattering terms, in which the poet is invited to spend some time, every summer, with his Majesty in his palace of Sans Souci.

Cure for the Sting of a Wasp.—It cannot be too generally known at this season, that *Spirit of Hartshorn* affords an instant cure for the sting of the wasp.—*Globe.*

Singular Fact.—A resident of Puckington, near Ilminster, hearing that his bees were more than commonly noisy and very busy, watched their proceedings, when he discovered that they were actively engaged in killing the drones and throwing them from the hive. His attention was presently directed to a still more extraordinary fact; for underneath the stool on which the hive rested the observed a large toad eagerly devouring the drones as fast as they fell to the ground; but when two came together the toad placed his paw upon one of them till he had eaten the other; and when any length of time elapsed before one fell to the ground, he would apparently hearken and look upwards, in eager anticipation of a further supply.—*Sherbourne Journal.*

Niger Expedition.—The second iron vessel has been launched at Liverpool, and christened the Albert. The other two are to be called the Wilberforce and Soudan; the latter has received her machinery on board, and is about to be tried at sea. On the Admiralty, is the announcement that they are to be commissioned for this service by Captain H. D. Trotter, Commander William Allen, and Commander Bird Allen; that petty officers, including artificers of all kinds, will be entered on board the Britannia, at Portsmouth; the Impregnable, at Plymouth; the William and Mary, at Woolwich; and the Redwing, at Liverpool. "None will be entered but those who can produce testimonials of unexceptionable character. Double pay on leaving England. Well-qualified engineers of first and second class, and engine-drivers or stokers, may apply at her Majesty's dock-yard, Woolwich, and at Capt. Bevis's office, Liverpool."—*Literary Gazette.*

Three Skeletons Found.—A curious discovery has been made, within the last week, during the progress of the works for the Great Western railway. The workmen, while engaged at Bathampton (a pretty village in the neighborhood of Bath), found three skeletons, two of which were lying side by side, while the third was within six or seven feet of the others. In the breast of one of these skeletons was discovered *a ball of a pound and a half in weight*, from which circumstance it has been presumed that the bodies were those of individuals who had fallen in some of the battles during the civil wars. The ball is in the possession of a person in the neighborhood of the spot where these curious relics were found. Many exceedingly interesting remains of antiquity have, at different periods, been brought to light during the progress of the railway between Bath and Bristol, but the above are among the most remarkable of those remains.

The Nassau Balloon is about to ascend from Norwich, five gentlemen having engaged to accompany Mr. Green in his aerial voyage across England the first time a favorable wind prevails.

Departure of the "Great Western."—This unrivalled steamer left her moorings in King's road, Bristol, on Saturday last, at her appointed hour (one o'clock), and steamed off down the Channel in superb style, with a stiff breeze from the N.N.W. She carries out a valuable cargo of light manufactured goods, chiefly silks, and a very large quantity of letters and newspapers. Her arrival in New York will, no doubt, create a very great sensation, as she will bear the recently-received highly important warlike news from France and the East, as well as the China news The Great Western has 65 passengers.

A Viper per Post!—A gentleman resident in this town received, a day or two ago, through the medium of the penny post, a living viper, from the foot of Cader Idris, in New South Wales! It arrived safely, and was not at all the worse for its journey.—*Hereford Times.*

The Opening of Blackfriars Bridge.—It was determined on Monday in the Blackfriars Bridge Committee, that the bridge should not be opened for carriages until the 2d Oct. We understand that the postponement has taken place in consequence of the request of the contractor, who, being resolved to complete the engagement in the most perfect manner, requires that the pavement be not travelled over until a fortnight shall have elapsed. The committee have not confined themselves to merely repairing the bridge, but have wisely directed their attention to the removal of the intolerable nuisance arising from the communication of the open sewer, called the Fleet Ditch, at the north end of the bridge, with the river. It has been the subject of great complaint, that the sewers of the metropolis emptied their filthy contents into the open air, almost at the level of high water, so as seriously to endanger the health of the immediate vicinity. Mr. Walker, the engineer, having been directed by the committee to consider the best means of correcting the evil, proposed a remedy, for the efficacy of which the committee offer their unanimous responsibility. The engineer recommended the fixing of an iron culvert, 12 feet wide, 3 feet 6 inches high, 250 feet long, with a fall of several feet below the shore, to receive the filth as it falls from the covered sewer, and to carry it, still under cover, down to the low water of a low tide; and in the centre of the opening of the tunnel or arch of the sewer, where it enters the river through the wing wall of the bridge, which is elliptical, 12 feet wide and 18 feet high, being an area of 170 feet, to hang three iron flaps, to move in or out by the action of the wind or water, and the space above to be covered with iron plates to prevent the escape of the effluvium. This plan of Mr. Walker was recommended by the Blackfriars-bridge Committee to the Court of Common Council, who referred it back to be carried into effect, and the work was nearly completed, when the Commissioners of Sewers for the city raised some objection to the closing of the mouth of the sewer. This work of such extreme importance is thus temporarily checked; but we shall narrowly watch the proceedings of the Commissioners of Sewers, who, although appointed by the Common Council, the moment they are appointed become quite independent of that body.—*Times.*

The Lunatic, Oxford.—The intrepidity of Messrs. Lowe, opticians, Copthall-court, in seizing the lunatic, Oxford, on the 10th of June, has been rewarded, we observe, by Prince Albert appointing them his opticians. We hear, he has given them a still more substantial proof of his gratitude, by ordering a number of articles to be made, of the most costly description and elaborate workmanship.

REPORTS OF SCIENTIFIC MEETINGS.

ROYAL SOCIETY.

At the last anniversary meeting held in November, 1839, the number of fellows on the list of the Royal Society was as follows:—Patron and honorary, 11; foreign, 48; having compounded, 556;

paying £2 12s. annually, 27; paying £4 4s. annually, 166; making in all 808.

The total payments made by the society for the session 1838-39, were £2,541 1s. 9d.; and the total receipts, £4,349 11s. 4d. Leaving a balance in the hands of the treasurer of £1,808 9s. 7d.

BOTANICAL SOCIETY OF LONDON.

Sept. 4. Daniel Cooper, Esq., Curator, in the Chair.

The secretary announced the following donations received since the last meeting:—A series of plants from Natal, Southern Africa, comprising upwards of 350 species, collected and presented by Dr. F. Krauss, of Stuttgart, during his travels in those regions. Likewise, collections of British plants, from Mr. S. P. Woodward and Mr. Fordham. The curator exhibited a specimen of *Aspidium Cristatum*, collected by Mr. S. P. Woodward, in July last, by the side of a drain near Fritton Broad, Suffolk. Mr. T. Sansom exhibited specimens of the *Hypnum rugulosum* and *Bryum affine*, from Mr. Eagle, and first discovered by him at Mildenhall, Suffolk. A specimen of *Schystega pennata*, from the Rev. C. A. Johns, who lately discovered it at Kelston, Cornwall, was likewise exhibited. A communication was read, being some observations on a monstrosity of *Polytrichum commune*, by Mr. T. Sansom, which exhibited the union of two *Calyptreæ*.

Mr. Arthur Wallis forwarded a paper, on the "Orchideæ of Essex," chiefly with a view to elucidate the influence of soils in the distribution of this family. The northern parts of Essex are characterised by chalky deposits, extending from Cambridgeshire and Herts, occasionally interspersed with loamy sand, and on the high ground alluvial clay. Proceeding southward, the soil still consists of heavy loam, and in some districts extensive fields of gravel. On reaching the central parts of the country (including the neighborhood of Chelmsford for some miles) there is a rich black mould, with occasional spots of clay and gravel, but no chalk. The extreme west consists, in addition to many fertile spots of gravel, of alluvial clay; and in those parts bordering on the Thames, as Purfleet, Thurrock, &c., the chalk predominates. Mr. Wallis observed, that though this tribe more especially delights in a calcareous soil, yet he had found them in all the varied habitats which the county presents. He is of opinion (however important may be the influence of soil) that their existence depends almost as much on the nature of the locality, with respect to the surrounding vegetation, as in any peculiarities of the former; hence he concludes, that most of our Orchideæ may be termed *Epiphytical*, inasmuch as they generally flourish in greater luxuriance in districts where the ground is studded with roots, not having ever found specimens of any of the genus that were not either growing in the vicinity of woody vegetation, or surrounded by dense patches of grass. Notica was then made of *Listera Nidus Avis*, which Mr. Wallis had invariably found growing on the underground part of the stems of the hazel or elm, avoiding every locality where there is grass, and as its fleshy fibres saldom go much depth in the soil, but rather appear to absorb nutrition from the roots of their stouter neighbors, Mr. Wallis is almost inclined to consider this plant as a true parasite. Certain it is that not only the *Listera Nidus Avis*, but the greater part of the whole of the tribe, require the aid of other plants to promote their more perfect development; and it appeara to Mr. Wallis, to be atill a subject worthy attentive consideration, as to whether they absorb nutrition directly from the soil, or indirectly through the medium of other vegetation.

Although the country is not essentially a chalk district, yet many of the Kent, Cambridge, and Herts species are found, forming a sort of botanico-geographical connecting link between the clay and loam of the former with the chalky soil of the latter. Mr. Wallis enumerated 17 species, including eight genera.

The chairman announced, that all parcels of plants intended for the next annual distribution of British plants, are required to be forwarded in the course of the present month. The meeting then adjourned.

URANIAN SOCIETY.

Sept. 1st. W. H. White, Esq., Vice President, in the Chair.

The following paper on the Heliocentric motion of the moon, or her true path in space, by Lieutenant Morrison, R.N., was read.

The generally received opinion that the moon revolves round the earth during a synodical period, or rathar that both earth and moon revolve around a common centre of gravity in that period, appears to be at variance with observation, and to be directly contradicted by facts, on which all parties are agreed. It appears that when by degrees the astronomers of Europe gave in their adhesion to the new doctrines of Copernicus, the idea of the earth being a centre of motion was not entirely abandoned; and that though it could no longer be asserted that the sun went round tha earth, yet the fact that the moon, at least, was seen regularly on all sides of the earth, was sufficient to prove that she did go round the earth; and that, therefore, although the sun must be admitted as the centre of the earth's motion, the earth still claimed the honor of being the centre of the moon's motion. This idea has never been proved, yet it is so extremely consistent with what appears to our senses, that it has never been questioned.

Mr. M. doubts not that astronomers are aware of the true course of the moon through space, but the public are not; because books upon astronomy are silent on the subject. It is universally taught that tha *apparent* path or orbit of the moon around the earth is a reality; whereas, it is merely an *appearance;* for the true motion of the moon is in a *fluctuating curve*, almost the same as the orbit of the earth; and although in a long period of time it exactly equals this round the sun, yet in the course of one synodical period it is the farthest possible from being a circle or ellipse, or anything approaching thereto.

If we take the moment of conjunction of the luminaries, we find the moon in tha line of the radius vector; and, if tho earth stood still, as the moon's mean motion exceeds that of the sun by 12.19075 deg. in a day, it will follow that in 12 hours the moon would form an angle with the sun 6 deg. 5 min. 43 sec. Therefore, taking the mean distanca of the moon from the earth, 237,000 miles, as radius, we find the moon removed from the radius vector when ahe forms that angle, a distance equal to its sine, or 25,165 milas. But during the 12 hours, the earth, moving at a mean rate of 68,000 miles per hour, will have moved just 816,000 miles in the *reverse* direction. If, therefore, the moon did really move those 25,165 miles, as ahe appears to do, the earth would be *separated* from the moon, would have *left her behind nearly four times her mean distance*. But the moon is never ao left behind, and it follows that she moves forward *pari passu* with the earth, but less swiftly; her actual motion through spaca being in the 12 hours 816,000 miles, *minus* the sine of the angle formed with the sun. And it may be also shown that the moon in that time *increases* her distance from the sun equal to the versed sine of the same angle; which in the case named will be 1,340 miles. Now, when the angle the moon forms with the sun amounts to 90 deg., the sine will equal the radius, and, therefore, the moon will have travelled that amount, or 237,000 miles lesa than the earth. But the versed sine will also equal the radius; and, therefore, the moon will hava increased her distance from the sun the same distance of 237,000 miles; and will now be found as far from the sun as is the earth; baing in the line of the earth's orbit, instead of that of the radius vector.

It may be thus shown that, from the period of the moon being nearer the sun than is the earth, the moon moves *slower* than the earth; and the amount of her RETARDATION from the last quarter until the first is exactly the diameter of her *apparent* orbit; while from the time the moon is outside the earth's orbit she moves *faster;* her ACCELERATION from the first to the last quarter being the same diameter. The retardation is at a maximum at the conjunction, being then 1,326 miles in an hour; and at a minimum at the quarters, being then only two miles in half an hour. The acceleration is at a maximum at the full moon, and a minimum at the quarters, the numbers being as the others. The maximum of repulsion from the sun is at the first quarter, and of the attraction to the sun at the last quarter; the hourly amount in both cases being 1,326 miles. The attraction and repulsion are *nil* at the new and full.

These various effects are evidently the result of forces, which, if they be not the same, are extremely similar to those of common electricity. If we consider the moon as a pith ball, attracted by a body positively charged, we shall see her attracted to the sun gradually during half a synodical period, and then repelled at the same rate during the other half. The moon being charged more highly than the earth, while *nearer* to the sun, has a larger proportional electrical atmosphere, and moves *slower*. But when the earth is nearest to the sun, the earth moves slower than the moon; that is, from the first to the last quarter.

But whether this hypothesis be accepted or not, it still remains clear that the moon does not move in an ellipse round the earth, her path being an extremely elongated and fluctuating curve. Neither does the earth move round the centre of gravity; which, being only about 6,000 miles from the earth's centre, will itself form a similar, but still more elongated curve, during each synodical period.

The only ground on which it has been asserted that the moon moves round the earth, is the fact that during the synodical period she is seen in every part of her apparent elliptical course. But this very appearance obtains equally *at the moon*, as regards the earth, and, therefore, a moon-philosopher might assert the same thing, reversing the terms; viz. that the earth travels round the moon! It may probably result that, if we determine the true course of the moon in space, we may readily calculate her heliocentric position, and so arrive less laboriously than at present at her geocentric place at any given moment.

The meeting adjourned till 6th October.

POLAR OSCILLATION.

To the Editor of the "Inventors' Advocate."

SIR,—In answer to Lieut. Morrison's remarks on my paper on the Oscillatory Motion of the Pole, allow me to observe that this gentleman is wrong in supposing that I have mistaken the question, as he says in your last: "It is not tha pole of the earth, or rather of the equator (which alone would produce, "variation on the latitudes") *but the pole of the ecliptic!* which is considered to revolve. The pole of the earth may remain exactly where it is, at 90 deg. distant from each point of the equator, &c. &c." Now, if the pole of the earth remain where it is, how can a revolution of the pole of the ecliptic produce any variation in the latitudes and longitudes on the earth's surface?

The axis of the earth always remains parallel to itself during the motion of tha earth in its orbit about the sun.

The obliquity of the ecliptic, according to the theory of *Laplace*, has an oscillatory motion which would amount to about 10 deg. 18 min., but the excess of attraction exerted by the sun and moon on the protuberant parts of the earth at the equator nearest to them, over and above their attraction on the most distant parts thereof, tends in a great degree to reduce the above amount, so that it cannot exceed 2 deg. 42 min., as the motion of the

equator will in consequence of this excess of attraction follow that of the ecliptic. Hence 2 deg. 42 min. is the resultant, or *maximum variation* between the two motions. The sun cannot be vertical at the poles only on the condition of a *consecutive* motion of the obliquity in about 2½ millions of years; instead of an *oscillatory* motion as stated by *Laplace.*

It is evident that the earth's axis does not always point to the same fixed star, as in the year 2104 our present polar star will approach nearest to the pole, or to within about 7 min. After this time it will recede therefrom, and about the year 15038 our present polar star will be 8 deg. 35 min. south of the zenith of London.

Variations in the latitudes and longitudes of the fixed stars are constantly taking place; but no variation of the latitudes and longitudes on the earth's surface will result from this circumstance.

Having proceeded thus far, I must defer the conclusion of this paper to another opportunity; and remain, Sir,

Lynn Regis, Yours respectfully,
14th Sept., 1840. J. UTTING.

LONDON MECHANICS' INSTITUTION.

ORIGIN AND HISTORY OF THE CRUSADES.

On Wednesday the 9th instant, the Rev. Dr. Vaughan commenced a course of lectures at the London Mechanics' Institution on this interesting subject. He commenced by remarking on the saying, that "Great events from little causes spring," which was so singularly exemplified through the exertions of Peter the Hermit. Such circumstances, however, are but impulses, and the last link of a connecting chain. When we see a nation at work, we know that causes have been in operation to promote it, and when a continent is at work there are again causes, the last of which cresting the impulse is but a contribution. Thus Luther never would have attained his greatness had not Wycliffe and Huss preceded him, and their influence was favorable to the times; Cromwell and Napoleon might have remained in obscurity had they not come into being at their times—they came on the wave of occurrences, and shaped themselves according to that wave. Several causes could be brought to bear upon the origin of the crusades, a principal one being in the conquest of the Mahommedans, who, at the commencement of the seventh century, had got in their possession the fairest portions of the east, held Egypt, Morocco, and Sicily, penetrated into Italy, even to the walls of Rome, and went even into the fairest portions of Spain. Europe, feeble as it was at that time, kept them, however, from coming across the Pyrennees. The crescent was the symbol of onslaught, plunder, and oppression, and there was still a cherished animosity of Christians against the Mahommedans. Warlike nations often overshoot their mark, and instruct those who do not wish to be instructed in warfare, by which they themselves ultimately become overwhelmed. This was the case with the Mahommedan power, and it could be hardly doubted that some event would bring into collision these two great sections of the civilised world. An important cause of the crusades was the military power and taste which pervaded all Europe. It was the period when the modern engrafted itself upon the ancient civilisation, when there were not wanting appearances of dormant refinement, when literature and science began to develope, and this was the heroic period of Europe. The people of Europe stood united in the position of lord and vassal for service and protection, and the profession of arms was a dignified vocation. Tasso stood to the chiefs of Britain as Homer to those of Thessaly, Epirus, and Greece. The chivalry of Arabia was older than that of the Mahommedans, but chivalry was largely increased as well as fostered by the crusaders. In their state of society at this period, it was considered an embellishment. Warriors were above the savage, for they became just, generous, courteous, and humane. The chivalry of the day made it the heroic period, and our own Richard I. bears no mean comparison to the great Achilles.

Another great cause was the natural reverence which the mind has to places which have been the scenes of interesting occurrences. We feel a pride in reflecting on those who have been more prominent in pursuits, honors, the service of our country, and of our religion. If such is the case in more common events, what higher feelings are not induced in objects of religious veneration? There must be, in the nature of things, something more in this than in others to affect and influence the mind. We need not take into consideration the truth or falsehood of what was their belief; but there were facts, which interested the highest and the lowest. They took an instinctive interest in those scenes, valleys, and mountain sides in which the founder of Christianity had performed his miracles; they remembered them as the places of his toil, reproach, his agony and his dissolution! Along with these reverential feelings there rioted much superstition, and the natural effect of all was to give to Palestine and Jerusalem an interest over all other places. Palmyra, Athens, Thebes, all had their glory, but these were only secondary. Another circumstance by which these feelings were accelerated, was, that the rulers of these different countries in the possession of the Mahommedans permitted Christian pilgrims, by paying a tribute to their revenue, to visit the sacred places. They were exposed to mockery, insult, and oppression, and when they returned home they told to all quarters the scenes which they had witnessed, to men of martial character and generous ardor, who felt anxious to redeem from their possessors places which they thus held in sacred reverence. Then, again, as another cause, was the temper of the ecclesiastical system of that day. The feudal system was very powerful throughout Europe, and the tie was small to the monarch in comparison with the lord. Power was not so generally concentrated, but was confined to the lower aristocracy, and it was found difficult to obtain a combined effort upon secular occasions. There was, however, an ecclesiastical head, which had access to the lord and the vassal, the ecclesiastic and the civil power, and to whom all European society did bidding. In these distracted states of society, when lords and barons were powerful, the church appointed one day in each week when all hostility should cease, and this, which was called the "Truce of God," was ordained as a security both to the trafficker and farmer. By this, some degree of good was accomplished, and the people saw that the pontiffs looked upon them with greater friendship than the princes of Europe. One effect of it was to divert feelings of intestine discord by transferring hostile feelings to the Saracens. Many of these things clustered round the papacy, and formed the machinery which enabled it to accomplish such extensive purposes. The Cardinal de Fleuris says, that the crusades devolved on the pontiffs, as having the most secular power of any in Europe. They, too, had seen the effects and the great influence of indulgences, and the crusades gave them greater power, because they maintained the privileges of the former. The nobles had many crimes to answer for, particularly in their oppressions to the poor. They had, besides, the privileges of riding on horseback and bearing arms, which they were before not permitted to do when undergoing penance, which the going to the crusades was another example of, and they eagerly followed the standards. The vassals again followed the nobles rather than stop at home, and the prowess of these immense armies which were thus collected was stimulated, that whoever fell in battle would be saints. To these causes must be added another, which was the restless state of Europe, arising from local feuds. Europe itself was in a great state of suffering, and there was a general insecurity of property; many of the knights and nobles went out to benefit their condition, so that the usual causes which prompt to emigration then existed; and we must add to this, the war spirit then existing, which, having been long compressed, found this vent whereby to escape.

In the train of all these, came Peter the Hermit, a man of great enthusiasm, who followed after a plan had been laid 20 years before by Gregory VII., one of the best of all the pontiffs, for retaking the Holy Sepulchre. So far did his influence extend, that no less than 6,000,000 persons enrolled their names in the wars of the crusades. The movement so energetically made, was of long continuance, and for 200 years Europe seemed formed for no other purpose than to defeat the Mahommedans. Peter came in, however, only as the last small weight which turned the balance that had been so long pending. We see, in these movements, many maladies, but there was some health in them. Surely there must have been some justice or moral sense, some appearance of right, or Europe, dark and degraded as it was, would not have supported them. In them we may often see the fool, and, next him, the knave; but there were too many of the best of mankind. The lecturer concluded in a very able and eloquent account, by lamenting the want of an impartial historian of these ages. He showed that historians should be persons of some power of discrimination, not merely men of intelligence, but possessed of a clear head. It required men of a rare class to ascertain the difference of points existing between us and those long gone by. They should discriminate what was common to humanity, and recollect that we are descended from the men whose follies had been described, and they should inquire whether some of those follies which were least defensible did not exist amongst ourselves. The lecturer concluded amidst loud applause.

ON MECHANICS' INSTITUTIONS.

The last *Bedford Mercury* contains the report of the foundation of a new Mechanics' Institution in that district. We always derive the greatest pleasure from the reports of the mechanics' institutes, philosophical societies, and scientific institutions, established in all the provinces of the country, but more especially from those established throughout the embrace of our provincial districts. We hope to see them ramifying and propagating themselves through every corner of the island; nor, seeing what we have seen, do we greatly care from what humble beginnings they may originally spring, because we have seen the humblest beginnings swell into important and influential associations. These societies take the lead in agitating the great questions which ameliorate human existence, and in imparting the influence of their moral example to the onward impulse of universal mind. This is an object too sacred and too important to be melted away in the breath of party spirit. It has been sneeringly said, that "a little learning is a dangerous thing"—that a little knowledge may do a man harm. This is a false principle, though it has grown into a proverb. All knowledge is an accumulation of facts which establish *truth*, and it is better to have a little of that truth than to have none at all. The fears entertained by the exclusive classes of its diffusion are most irrational: the diffusion is, in fact, their safety—it is the safety-valve of the social engine. As the people possess more mind and more information, they will dislike and decline all appeals to brute force. That is the only force to be apprehended, and that is only a force employed by the *uneducated ignorance* of the popular masses. When changes occur—and changes must occur as society progresses towards its final goal—they will take place among an educated people in orderly accordance with law, and in tranquil conformity with the dictates of neighborly kindness and of good sense. There are other advantages connected with these institutions, with which the mercantile and trading prosperity of the whole country is intimately bound up. The importance of promoting scientific knowledge among our mechanics is essentially necessary to England's successful competition with the active industry of foreign markets. Such

knowledge is requisite to maintain the ascendancy of our commerce. Let the mind of England be cultivated as well as her plains, and the day will not be far distant when she will reach to an incalculable height of power, of wealth, and of moral greatness. All the scientific elements of this great result are now in active operation. But it must be by the combination of educated mind with social morals that we shall procure and secure this future greatness for our country. By their union, and by their instrumentality, the mightiest triumphs may be accomplished, and so impelled and directed it is impossible to calculate the extent to which the national power and the commercial prosperity of England may ultimately attain. Let us reflect, moreover, that while we promote our own commercial advantages by promoting the scientific knowledge of the artisan, we are diffusing innumerable blessings to the furthest bounds of the earth, and enlightening, civilising, and Christianising, by our commerce, the benighted heathen and the untamed savage, in the darkest corners of the earth.—*Morning Advertiser.*

THE THEATRES.

"See that the players be well used."—*Hamlet.*
"Nothing extenuate, nor aught set down in malice." *Othello.*

COVENT GARDEN.—No novelties whatever have been yet produced; but to-night we are promised Mr. Sheridan KNOWLES' new play, *The Bride of Messina.* It is well cast; and from what we saw of it at the last private rehearsal, we prognosticate it will have a run.

HAYMARKET.—Uninterrupted success still attends this popular theatre. We have now to congratulate Mr. WEBSTER on his having revived Holcroft's admirable comedy,—the *Road to Ruin*, with the full strength of his establishment. It has afforded PHELPS and Mrs. STIRLING a noble opportunity to show the extent of their abilities. The former as *Old Dornton*, was by far the best representative of the character now living. There were some very fine touches of nature in his performance, that appealed at once to every heart; and which failed not to be warmly acknowledged by the audience. Mrs. STIRLING made quite as lively an impression in *Sophia.* From first to last she was the same artless, fond, and loving girl;—simple, confiding, and playful. There was a repose, too, in her acting, that proves how carefully she had studied the part, and how well she liked it. WALLACK was equally happy in *Young Dornton*, whose career of dissipation, folly, and repentance, he depicted with the truth of nature. STRICKLAND was *Mr. Silky*, and threw such light and shade on the wily old rascal's character, that it was one of the principal features of the play. It was an admirable performance throughout. WRENCH called himself *Goldfinch*, but it was a mistake altogether,—a complete burlesque, without any humor. Mrs. GLOVER, though mentioned last, is worthy of more praise than we know how to convey by words. Her *Widow Warren* was a delicious *morçeau.* None but a very skilful actress could have come through so triumphantly; for, in sooth, the widow frequently has to covet in very ardent terms the joys of wedlock; a delicate subject in unpractised hands. The play was admirably performed throughout, and announced for repetition amidst acclamations.

ADELPHI.—The very rapid progress made in the alterations, which for some time past have been going forward in front of this theatre, gives token of their speedy completion. It may, therefore, be safely conjectured that at the accustomed period of opening, or thereabouts, the indefatigable manager of this favorite place of entertainment—Mr. Yates, will make the bow he customarily makes at the commencement of his season. Though, like its predecessor, necessarily a narrow one, the new *façade* presents a more imposing and theatre-like appearance, and, what is infinitely better, affords to visitors greater facility of entrance to box, pit, and gallery. Beyond an improvement in its ventilation (no small boon), and some minor points of decoration, the auditory remains much in its former state.

IMPROVEMENTS IN SOUTHWARK.

A meeting of the inhabitants of the borough of Southwark was held on Thursday, at the Town-hall, at which Mr. Jackson, in the absence of the High Bailiff, presided. The definite object of the meeting was to take into consideration that part of the report of the Committee on Metropolitan Improvements which recommended that a sum of £30,000 should be given for the purpose of improving the public streets of Southwark. From the discussion which ensued, it would appear that a committee had been formed, who had adopted a plan of communication between the Borough and the *termini* of the various bridges to the west of London, and with a view of effecting such object were prepared to sanction a proposition which had been made by Mr. Hiscocks. That gentleman's plan was to construct a main street leading from the end of the Great Dover-road, through the Mint, into Blackfriars road, to come out opposite, or nearly so, to the New-cut, by which means a clear carriage and footway communication would be had with the Southwark, Blackfriars, Waterloo, and Westminster bridges.

One great argument in favor of this proposition—an argument which was urged with very considerable power by Dr. Evans, Mr. J. L. Stevens (the latter of whom referred in highly complimentary terms to an "Abstract of the Report of the Select Committee on the Health of Towns," which appeared in the columns of this journal of Wednesday, a document which he strongly recommended to the perusal of all classes of society), and others—was, that if carried out it would accomplish the removal of the greatest moral blot and plague-spot in the Borough, by the annihilation of a locality called the Mint, a place distinguished for the misery and wretchedness of its inhabitants, the dilapidation of its buildings, the crime of which it was the sink, the shelter which it offered to the depraved and wicked, and the scenes of immorality which were not only nightly, but daily, practised therein.

It was stated also by Dr. Evans, that it was in this place that the first case of decided and distinct cholera in the metropolis had made its appearance; in fact, continued the medical gentleman, such was the confined and filthy state of that particular district, that there was more danger of disease arising from the noxious atmosphere without, than from the misery and poverty that reigned within the wretched buildings of which it was composed. Mr. Carter, seconded by Mr. B. Thornton, advocated a plan which had been drawn out and laid before the committee of the House of Commons by Mr. Rose, and proposed an amendment to the effect that that plan was the better to be the first completed. The amendment, however, was negatived by a large majority, and a resolution approving of Mr. Hiscocks's, agreed to. The proposition of Mr. Rose was to make a street from Wellington-street, Southwark, to commence as near as practicable to the *termini* of the railroads in Tooley-st., and to be carried in as direct a line as possible, so as to come out opposite to Stamford-street, in the Blackfriars-road, by which means an easy access would be obtained to each of the western bridges. The ground of opposition to this plan was, that it would require a much larger amount than the Parliamentary grant, inasmuch as it would destroy very valuable property, whilst the great moral improvement of the Borough, by the destruction of the Mint, would not be achieved.

It was remarked by Mr. J. Day, that he should support the plan of Mr. Hiscocks mainly because it would destroy the Mint, at the bottom of which stood the workhouse of St. George's, in which building were confined no fewer than 3,000 poor persons, of whom nearly one half (as was understood) died annually in consequence of disease produced by the unwholesome state of the atmosphere they were compelled to breathe. A series of resolutions were agreed to, and a committee appointed to carry out the views of the meeting, which then separated.—*Times.*

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MEMOIR OF JACQUARD.

The following notice of Jacquard, the inventor of the loom which bears his name, is translated from a Lyons paper. It is published at the present time, for the purpose of directing the attention of the Lyonese to the honor of having given birth to a man who has so greatly inspired the manufactures of the town, in which it is contemplated to erect a statue in honor of his memory. The history of Jacquard, and the struggles and opposition he encountered, strikingly exemplify the discouragements to which even the inventors of the most useful machines are exposed.

Though Jacquard was the son of a silk weaver, he disliked the employment, and after some struggles with his father on the subject, who wished him to follow the same occupation, he became a bookbinder; a business which at that time was considered one of importance. Though he devoted all his time to his business, up to the worst days of the French revolution, the affection he entertained for his father, and the compassion he felt for the sad condition of the weavers, induced him to form the idea of improving the looms, so as to remove the difficulties and the hardships experienced by the weavers with the machinery then in use. In the midst of his occupations, unconnected as they were with silk weaving, he never ceased to meditate on the plan, which he was not able to execute until he was fifty years of age.

He had married the daughter of a gunsmith, who was supposed to be rich, but who, in reality, had no money. He had, however, a treasure in his wife, who bore him a son, to whom he was devotedly attached.

When, in 1793, the Lyonese raised the standard of resistance against the Jacobin Club in Paris, Jacquard, who had then been for some time employed in working a quarry of gypsum near Lyons, hastened to participate in the triumph or ruin of his fellow citizens. During all the siege of Lyons, he served at the advanced posts, as an under-officer, having his only son, who was about fifteen years old, almost constantly by his side. After the Lyonese were subdued by the Jacobin forces, Jacquard was obliged to conceal himself in order to escape the guillotine. One night, his son, who owing to his extreme youth was permitted to walk about among the ruins of Lyons, came to Jacquard to inform him that his place of concealment had been discovered, and that he must fly without delay. The son had enlisted himself and his father in a regiment that was on its march to Toulon, as the best means of concealment, and they both set off immediately to join it. On the following morning, by day-break, the revolutionary police visited the place of Jacquard's retreat, but he had escaped. He served with his son in the regiment of the Rhone and Loire. He was appointed a member of the council of discipline, and in this capacity he had the superintendence of a number of undisciplined prisoners in the village of Haguèneau. The sound of cannon was heard. "Comrades," said Jacquard, "those who love me will follow me. I promise pardon to all those who will ask for guns to fight." Every one followed him, joined in the battle, and were pardoned.

Jacquard would probably have remained some time longer in the army, where so many honorable citizens had taken refuge, like himself, to escape the hatchet of the executioner, if in a bloody battle which shortly followed his darling son had not been mortally wounded by his side, and died a few days afterwards in his arms. The unfortunate father, who on account of his age could not be compelled to continue in the army, returned disconsolately to the place of his nativity, which he found covered with ruins. As the house he occupied at Lyons during the siege had been burnt, and he had decamped suddenly without being able to let his wife know where he was going, and dared not communicate to her his secret by post, he had great difficulty in finding her again. She was in a kind of hay-loft, occupied in plaiting straw for common hats, with her daughter, who remained constantly with her, and who never afterwards left Jacquard, but remained with him till his death.

The man who by the work of his genius bestowed on so many the means of enriching themselves, the originator of the great fortunes made in the town of Lyons, was obliged for a long time to participate in the miserable labor of his wife, to procure the means of subsistence. But better days at length began to dawn on him. Manufactures and the arts, which had been so long driven from the city, began to return, and Jacquard soon found himself surrounded by encouraging circumstances. He was, therefore, enabled to execute the model of his machine, and to present it to the exhibition of the products of national industry, in September 1801; at the close of which he received, as a recompense, *a bronze medal*.

When his invention began to be introduced into manufactories, it had to contend against the combined opposition of routine, unskilfulness, and envy. Independently of the clamor of certain private interests, which would be injured by the introduction of the new machines, Jacquard was accused of deranging the manufacture, and of reducing the workmen to beggary; they even went so far as to pretend that he had been paid by foreign nations for that very purpose. The superintendents of manufactories, either unintelligent or purposely unskilful, wished to render him personally responsible for the damages which they pretended they had sustained from the use of his machinery. In fact, he was charged with this offence before the town council, and exposed to demands for indemnity. In short, calumniated, insulted, and reviled, nothing remained but that he should be beaten. Even this insult at length he suffered two or three times. One day, near the Gate of St. Clair, the authorities rescued him from the hands of a furious mob, who wanted to throw him into the Rhone. This unjust treatment could not deter him from pursuing the object he had in view. Fortunately time has revenged these insults; and among those who vowed his death, there is perhaps more than one who has subscribed to the monument which it is proposed to erect to honor his memory.

In 1801, he obtained a pension of 3,000 francs. It is said that Napoleon, in signing the paper by which the town of Lyons for the sum of 3,000 francs per annum obtained the right of property to all the machines that Jacquard had made or should make, said with astonishment, "here is a man who is content with a little!" And, in fact, he was content with it. The government had allowed him a certain premium for every loom to which his improvement should be adapted. He neglected to demand it, for it would have been requisite to have entered into investigations, which he was unwilling to undertake.

It often happened that, at the request of some proprietor of a manufactory, he would make models of different improved pieces of mechanism for different operations connected with weaving. The manufactures benefited by these improvements, frequently without giving Jacquard any recompense for his trouble; and when he heard of their successes, in consequence of the adoption of his suggestions, he would say, "So much the better, if they become rich. It is enough for me to have been useful to my fellow-citizens, and to have deserved some portion of their esteem." If he had been in the least degree avaricious, and had made a demand on the government or on the town in addition to his pension, it would have been difficult to refuse it, when the mere importer of his invention, at Elberfelt, received a pension of 10,000 francs.

A small house in the country, charmingly situated, was the place where the last years of this

celebrated man were passed; after having made the fortune of Lyons, he became the example of the village of Oullins. The government of Louis XVIII. conferred on him the Cross of Honor. The town of Lyons, also, some years before his death, paid him the compliment of having his portrait painted, to place in the town hall. At length, after having been in his modest retreat the object of the homage of a number of distinguished men of France, and of other countries, after having been the cause of much envy and ingratitude, but of still greater happiness, this venerable old man died on the 7th of August, 1837, at the age of 82.

Jacquard has effected an improvement in the manufacture of woven fabrics equal to that which Guttenberg effected in the expression of thoughts upon paper; and, like to the discoverer of printing, his invention has caused to be made, quickly and well, what was before made slowly and often badly. Jacquard ought, therefore, to bestow upon his native town the same degree of glory in the manufacturing world, that the literary world bestowed on the native city of Gutteuberg.

PROCESS OF BLEACHING COTTONS.

There is at present a mode of bleaching cotton, which is doue purely by steam. It consists in steeping the cloths in an alkaline ley. They are placed, when thus steeped, in a tub with a double bottom; the first bottom on which the cotton goods rest is pierced with holes. Below this tub is placed a boiler, in which water is heated to the boiling point. The steam having no other escape, is obliged to pass through the cotton goods. At first it is condensed. After a little time the cloths become hot, and the steam does not pass through them until it has heated the whole quantity to the boiling heat. It will be perceived, that by this means the dirty water never comes in contact with the cotton fabric, as the water distilled by boiling alone touches them. This method, which is attended with many inconveniences, has not yet, that we know of, been adopted, excepting for the washing of domestic liuen, and it has not even in that respect beeu much used. In some bleaching yards, the heating of the goods to be cleansed is effected directly by boiling in the ley. For this purpose, the boiler is in the form of a long vertical cylinder, of the same height as the tubs which it is to supply, and near to which it is placed. It communicates with each one by two horizontal tubes, fitted with stop-cocks; one of which tubes is fixed at the bottom, and the other some centimetres below the upper part of the boiler. When the tube is filled with cottons, the alkaline liquor is poured on them until they are covered by the ley. It is evident from this arrangement, that the boiler will be filled to the same level as the tubs. Wheu the fire is lighted under the boiler, the heated portions of the liquid near the bottom rise to the top by their diminished specific gravity, and the liquid rises higher in the boiler than it is in the tub; but it then begins to flow immediately into the tub by the upper tube, and its place is supplied by the colder ley, which passes from the tub to the boiler by the lower tube. It is in this manner that a circulation of the liquid is kept up until all the liquid mass has arrived at boiliug heat. This method has the great advantage of not being attended with any danger, but it requires a much greater quantity of the alkaline liquor than the other. This is the cause of its uso not having been more frequent.

When the chlorine is employed, the cloths should be dipped in a very weak solution of the chloride of lime. They should not remain any length of time in the chloride bath; but should be steeped only for a few minutes, and then taken out, otherwise it might happen that some pieces of the chloride of lime might be deposited on the cloth, and make holes.

The action of the acids, which are employed immediately after the chloride of lime, is intended to decompose the chlorino on the cloth; by which means the chlorine in a state of gas attacks the coloring matter with all its energy. This produces sulphate of lime, which is removed by the subsequent rinsings. These processes require the greatest care, otherwise if any of the acid liquor remained on the cloth, it would destroy its fabric.

The foregoing is the mode of bleaching which was generally pursued, until the new process was introduced by Messrs. Price and Dunn, chemists and bleachers, near Boston, in the United States. Those gentlemen communicated, in 1837, to the Society of Manufactures at Mulhouse, that they had succeeded, and without a single failure, in removing grease marks by a ley of chalk; but, instead of using caustic soda in the subsequent operations, they used only carbonate of soda, or carbonate of potash. The Society at Mulhouse proceeded to test the experiment, and it was found that the process indicated by Messrs. Price and Dunn fully answered.

This is what takes place in the course of the operation:—The ley of lime converts the greasy matter into a chalk soap; and in the subsequent washing, the carbonate of soda or potash, by means of double decomposition, makes a soap of soluble potash or soda, and of the insoluble carbonate of lime, which has no affinity for the cotton.

M. A. Scheurer, who was employed by the Society at Mulhouse to examine and make a report on this method of bleaching, thus describes the different processes:—

"A piece of cloth was sent to me to bleach, which had been woven a long time, and was covered with grease marks produced in the weaving; there had also been purposely made on it some stains of a drying oil, well dried in with heat; and new stains of tallow were fixed on it, by passing a heated iron over it to burn it well into the cloth. I first soaked it for four hours in a hot thick ley. Next, in lukewarm acid for half an hour. Then in a lukewarm ley of soda, for four hours. Fifth, in an acid solution. The cloth treated in this manner had all the marks of grease removed, but it was not sufficiently white. I then steeped it in a weak mixture of chloride of lime and acid; in a ley of carbonate of soda for four hours; and again in a mixture of chloride of lime and acid. The cloth was by these means rendered beautifully white. It is desirable to steep the cloth in an acid after having been in the lime ley, as the acid removes the excess of lime from the calcareous soap which is formed. It must not be used either too strong nor too hot; as nearly cold as possible is the best, and the cloth should be soaked for more than four hours. Muriatic acid is for this purpose preferable to sulphuric."

Most of the bleachers in Alsace, and most other countries, have adopted the process we have now described. M. Edouard Schwartz, in a report to the Mulhouse Society, dated the 18th December, 1839, insists on the necessity of steeping the cloth in a ley of acid, immediately after the ley of lime; because, he says, that at present the decomposition of the calcareous soap on the cloth by carbonate of soda is not required, but rather the complete decomposition of this calcareous soap by an acid, thus to detach the greasy matter, which in this state is more easily soluble by the carbonates of the alkalis, than by alkalis in their caustic state.—*Moniteur Industriel.*

CASTING BY GALVANISM.

We recently mentioned, that a method had been adopted of applying the decomposing powers of galvanic electricity for taking complete casts of busts and statues, and that by this means the discovery of M. Jacobi, which hitherto had been limited to coins and medals, was calculated to become generally applicable. M. Soyer, the inventor of the improved process, has since given a more particular account of the plan he adopts to effect this object.

In a leaden vessel, furnished with an external case to hold the chemical agents, is placed a bag formed of raw hide or parchment, enclosing a cyliuder of zinc immersed in sulphuric acid diluted with water. This forms the voltaic battery. In a trough placed near the battery, is put the solution of sulphate of copper dissolved in sulphuric acid, and the model, either hollow or in relief, of which it is iutended to produce a fac-simile in copper. The communication is made by means of a strip of lead, and the model being previously covered over with a metallic preparation or film is thus brought into connection with the leaden vessel, and with sheets of copper which surround and cover over the model, and which communicate also with the cylinder of zinc. The operation then begins, and ought to be conducted with slowness and regularity; observing to keep the liquids always at the same degree of strength and action, which can be measured by the galvanometer. If the operation be too rapid, the surface of the cast is rough and streaked; the metallic atoms are unequally deposited, disturb the accuracy of the forms, and produce the effect of grains of sand. After the operation, the crust of copper which covers or is inside the model, is brittle. To render it malleable, it is only necessary to expose it to a certain degree of heat. This heat at the same time destroys the models if they be in relief, and there remains only the external crust of copper; the suppleness of which may be increased to any extent by heat.

When the model is not metallic, it is requisite to submit it to a preparation that will make it capable of attracting the molecules of the copper contained in the solution of sulphate of copper. If it be a plaster model, it is covered with an impalpable copper powder by means of a fine brush. If it be a vegetable, it is steeped in a resinous oil, and it is then covered with the copper powder. Without this precaution, the operation would not succeed; and all the places where the copper dust does not adhere will not receive the metal deposited by the galvanic action. There will, consequently, be holes in those places.

These directions comprise the principal parts of the process adopted by M. Soyer. When any part is omitted or not carefully attended to, the streaks, inequalities, and alterations of form are produced, which were frequent in the first attempts to pursue this process. At present, all these defects and difficulties have been removed, and the whole face of the bust of young Hercules, presented, on the 17th of August, to the Academy of Sciences at Paris, is completely devoid of the least imperfection. In the hair alone is there any trace of the sand-like appearance, which arises from the rapidity with which it was necessary to complete the operation in order to have the bust finished before the meeting of the society.

The opening which the galvanoplastic process affords to future applications of the principle in the arts, seems to be immense. Even as at present known, the process presents so much certainty and such advantages in point of economy, that M. Soyer has not hesitated to make an offer to the municipal council of Paris, to execute for 200,000 francs, a cast of the colossal elephant of the Bastile, which, in the ordinary mode of casting, would not cost less than 600,000 francs. The process will prove still more economical when applied to produce ordinary statues and public monuments, which need not be more than one-third their present thickness of metal.

The makers of artificial flowers, the manufacturers of copper instruments, goldsmiths and jewellers, may also derive great advantages from the galvanoplastic process, for it is not confined to

copper alone, but may be extended to silver, gold, or platinum. By this means, any object in nature may be made into a model on which a casting in metal can be made as perfect in form as the natural prototype. There seem scarcely any limits indeed, to which this process may not be extended in reproducing, in a solid metallic form, castings of every kind, and from any pattern, whether of natural or artificial objects.

TRIALS OF AMERICAN LOCOMOTIVE ENGINES.

BY CAPT. MOORSOM, R.E., ASSOC. INST. C.E.

The engines of which the author more especially treats, were constructed by Mr. Norris, of Philadelphia, and sent by him to England, under an agreement to supply "locomotive engines of a higher power, greater durability, and less weight," than could be obtained in this country. They were to be subjected to fifteen trials within thirty days, and prove their capability of drawing "up a gradient of 1 in 330, a load of 100 tons gross weight, at the speed of 20 miles per hour; and up a gradient of 1 in 180, a load of 100 tons gross weight at the speed of 14 miles per hour." The pressure of the steam in the boiler was stipulated by the Grand Junction Company (on whose railway the trials were made) not to exceed 60 lbs. per square inch.

The construction of these engines is very simple, and the work plain. The boiler is horizontal, and contains 78 copper tubes, two inches diameter and eight feet long each, with an iron fire-box. The cylinders, 10½ inches diameter, are slightly inclined downwards, and so placed that the piston rods work outside the wheels, thus avoiding the necessity of cranked axles. The frame is supported by six wheels; the two driving wheels, of four feet diameter, are placed close before the fire-box; the other four wheels, of 30 inches diameter, are attached to a truck, which carries the front end of the boiler, and is connected with the frame by a centre-pin, on which it turns freely, allowing the truck to accommodate itself to the exterior rail of the curve, and with the assistance of the cone of the wheels to pass round with very little stress upon the rails.

	TONS.	CWT.
The weight of the engine, with the boiler and fire-box full, was	9	11¼
That of the tender, with 21 cwt. of coke and 520 gallons of water.....	6	4¼
Total weight.....	15	15½

The engine, when empty, weighed .... 8 tons.

The trials were made on the Grand Junction Railway, in April and May 1839, and were continued over the whole distance from Birmingham to Liverpool, except when stopping short at Warrington to take loads, and occasionally making double trips, so as to travel the total distance of 156 miles per day. Attention was more particularly paid to the speed when ascending the gradients, which rise at the rate of 1 in 330 (16 feet in a mile) or 1 in 177 (29 feet four inches per mile), and as the engines approached these gradients frequently, either at an accelerated or a diminished speed, the observations were made at the points most remote from the cause of variation from uniform velocity. Some of the trials were made with such a number of empty wagons to make up the weight, that the train attained a length of nearly an eighth of a mile; this required some allowance, which was estimated at from one-eighth to one-ninth, in addition to the actual weight of the empty wagons.

The extreme limit of working pressure of the steam in the boiler was 62 lbs. per square inch, except for a few minutes on one occasion, when it rose to 64 lbs. The usual pressure for the locomotive engine boilers on railways now generally at work, is from 50 to 75 lbs. per square inch.

An analysis of the tabulated results of the several trips give these general results:—That on a plane of 1 in 330, with a load varying from 100 to 120 tons, the speed varied from 13 8-10 miles to 22½ miles per hour; that on a plane of 1 in 177, with a load of 100 tons, the speed varied from 9 8-10 miles to 13 8-10 miles per hour.

From the analysis, it appears, that allowing in five of the trials the stipulated amount of performance to have been made, and that in five other trials a doubt may exist, still, in the remaining eleven trials, the exact amount of duty demanded was not performed.

A comparison of the journeys up from Liverpool to Birmingham, with those down from Birmingham to Liverpool, gives rather a singular result. The aggregate rise of the gradients from Liverpool to Birmingham is about 620 feet—that from Birmingham to Liverpool is about 380 feet (exclusive in both cases of the Liverpool and Manchester Railway); the difference, therefore, up to Birmingham is about 240 feet. In seven journeys of 596 miles up to Birmingham, the engine conveyed 682 tons gross, evaporated 12,705 gallons of water, and consumed 177 sacks of coke (1½ cwt. each). In seven journeys of 596 miles down from Birmingham, the same engine conveyed 629 tons gross, evaporated 12,379 gallons of water, and consumed 177 sacks of coke. It would thus appear that the consumption of fuel was the same in both cases, and the only difference was the evaporation of 326 gallons of water more in the journey up than in the journey down, conveying nearly the same load both ways.

The author remarks, that in the early stage of his observations on the engine, he would have inferred that, from the mode of construction, it was not calculated for high speeds, such as are required for the mail trains, yet that he has often seen it travel with apparent ease at the speed of thirty miles per hour, and he thinks that, with some slight modification of the working parts, engines of this construction may be made to do any duty now required from locomotive engines; and, from the small quantity of repair required during the trials (only renewing the fire bars, which were originally intended for burning wood, and putting nine stronger ferrules in the tubes), he is of opinion that the present construction is exceedingly well calculated for heavy loads—that it may be modified for attaining high speeds—and will prove a durable and economical machine.

Captain Moorsom, in reply to some questions from several members, stated, that although the American locomotive engines had not strictly complied with the stipulated conditions, yet he considered them good serviceable engines, and it was the intention of the directors of the Birmingham and Gloucester Railway Company to have ten of them on their line. The price of the engine complete, including the import duty of 20 per cent., is from £1,500 to £1,600. One of the greatest advantages of the engines, is the facility afforded by the truck for going round curves—the same engineers managing indiscriminately the ordinary six-wheeled engines; and the American ones are observed to go faster round the curves with the latter than with the former. Round a curve of ten chains radius, they had gone at a speed of twenty miles per hour. They run also quite as well on a straight road. He had travelled on them between Whitmore and Crewe at the speed of from thirty to forty miles per hour. They appeared less likely to be thrown off the rails than other engines, as in some instances they had run over the short pointers of the Grand Junction Railway, the engineer had merely felt a slight jar, but no accident had occurred. He attributed this to the truck adapting itself so readily to the rails. The coke used in the trials was the same as that in daily use on the Grand Junction Railway, and was of average quality. The mode of attaching the tender to the engine was peculiar, and he conceived it to be advantageous, as it threw a portion of the weight upon the engine, and was an assistance in starting. The engines, as they are now constructed, will do well for all ordinary speeds; but, if higher speeds are required, a greater expense must be incurred, and certain alterations must be made in them.

Mr. Bury conceived the chief peculiarity of the engine to consist in the end of the boiler being placed on the moveable truck, which certainly enabled it to adapt itself easily to any curve in the railway. The cylinders are in the same position as those in the first of Stephenson's engines, and the other parts are as nearly as possible identical with plain engines constructed in England. The pointers on the Grand Junction Railway are constructed and placed in such a manner, as not to throw off a carriage which might run over them, and a four-wheeled engine would not have been thrown off by meeting a closed pointer. To enable him to form a correct comparative estimate of the work done by these engines, it should be shown what power was exerted at the wheels. This was a clear mode of arriving at a result and comparison with other engines.

Mr. Donkin remarked, that the flanches on the wheels appeared to be all that retained them on the rails, and that the truck turning on a centre-pin would allow a considerable lateral friction, unless there was some mode of keeping the truck in a proper position when on a straight line of railway. If this kind of engine is superior to those generally in use in this country, it must be in some part of the construction which is not shown in the model or by the description. He inquired whether in any of the four or six-wheeled English engines, any provision is made for changing the position of the axles, so as to allow of a divergence from parallelism when rounding curves?

Mr. Bury replied, that in the engines on the Leeds and Manchester Railway, although the axles were placed parallel to each other, a considerable allowance was made in the journals of one pair of the wheels, so as to facilitate the passage round curves.

The President observed, that the wheels being turned conically was of much assistance in passing curves, even although the axles were confined by the journals in a parallel position. He was aware that this threw an extra strain upon the curve rails, but that would only require more attention in securing them than on the straight line of railway.—*From the "Transactions of the Institution of Civil Engineers."*

MANUFACTURES IN BOHEMIA.

With the exception perhaps of Moravia, Bohemia has long been the most celebrated of all the Austrian states for its manufactures. At this moment, it produces the finest linens and linen yarns of any country in Europe. Spinning is the universal and favorite employment of the women; and no fewer than 500,000 females are said to prosecute it as a subsidiary business! Machines for spinning have, however, been introduced; but it remains to be seen whether they will be able to undersell the yarn produced by the hand. About 55,000 hands are supposed to be employed in linen weaving; and the total annual value of the produce of this branch of industry, including that of lace, may be estimated at about £1,200,000 a year. This branch of industry is said, however, to be on the decline, in consequence of the growth of the cotton manufacture. According to the National Encyclopædia, 20,000 individuals are employed in hand-spinning, exclusive of those employed in the factories, which are numerous; 18,000 hands are said to be employed in the hosiery department of the trade. There are about 500 bleaching establishments in full work, and the manufacture of potash is considerable. The woollen manufacture is very extensive; in spinning only, 55,000 hands are said to be engaged; and in weaving, from 15,000 to 16,000; the weaving of woollen stockings employs from 2,000 to 3,000 hands. The hat makers, furriers, &c., are estimated at 1,200; and the leather manufacturers at 4,000. There are about 100 paper mills; and the imperial

tobacco manufactory at Seidlitz supplies the whole country with that article, through the agency of above 7,000 retail shops. But of all the Bohemian manufactures none is nearly so well known in foreign countries as that of glass. Bohemian glass is not so pure as that of England or France; but the art of staining, painting, and gilding glass, is much better understood there than in this country, and articles of Bohemian manufacture are unequalled in point of lightness and richness of appearance. It is probable, however, were it not for the weight of the duties laid on glass in this country, and the troublesome regulations connected with their assessment, that we should soon become formidable rivals of the Bohemians, even in those departments in which they appear at present to have the greatest superiority. Altogether, it is said that from 1-5th to 1-4th part of the inhabitants of Bohemia are engaged in manufactures. But then it is material to observe, that all the hand-spinners and weavers combine with their business that of cultivators of patches of land, and other employments. We believe, too, that the cotton trade of Bohemia, like that of the rest of Austria, is entirely the creation of prohibitions and oppressive duties, on foreign stuffs and yarn; and that, were these repealed, or materially modified, the manufacture would be involved in the greatest difficulties. Owing to the want of capital, many of the great landed proprietors are obliged to engage in manufactures. Thus, Prince Kinsky, and Counts Harrach and Bucquoy, are the greatest glass manufacturers; Prince Auersberg manufactures sulphur, vitriol, and colors; Count Urbna and Prince Windizhgratz, tin plates; Count Thun, porcelain; Prince Lobkowitz, earthenware; Prince Wallenstein and others, beet-root sugar, &c. It is clear that manufactures carried on under such auspices must be more expensive and less improved than if they were carried on by individuals dependent upon them. — *From M'Culloch's Geographical, Statistical, and Historical Dictionary, part IV., just published.*

ENGLISH SEALED PATENTS.

*** *In our 57th No., the address of* Mr. John Thomas Davis *was incorrectly given; it* should be *No. 5, Bloomsbury-place, Bloomsbury-square, instead of 5, Bloomsbury-square.*

ENGLISH EXPIRED PATENTS.

Thomas Robinson Williams, of Norfolk-street, Strand, *a machine for separating burs or other substances, from wool, hair, or fur,* Sept. 18.

The same, *for an improved method of manufacturing hats and caps with the assistance of machinery,* Sept. 18.

SPECIFICATIONS.

ENTERED AT THE ENROLLMENT OFFICE.

(Continued from page 180.)

George Gwynne, Portland-place, Regent's-park, *improvements in the manufacture of candles, and in operating upon oils and fats,* Sept. 10.—The inventor claims, first, the means of refining fats and oils by means of carbonic alkalis. To obtain common candles of a superior quality, put 200 imperial gallons of cold water, with 280 pounds of carbonate of potassa, into a suitable vessel; apply steam, by means of a perforated pipe, till the mixture reaches the boiling point, then add 20 cwt. of tallow, and continue the ebullition for eight hours; then turn off the steam, and allow the whole to repose until the next day, when the greater part of the water, with the carbonate of potassa, will have settled to the bottom; this must be drawn off, by means of a cock at the bottom of the vessel. Then transfer the tallow to a suitable vessel, heated by a steam jacket, add 280 pounds of carbonate of potassa, then raise the temperature to 110 deg. Fah., keeping it well stirred till it is thoroughly incorporated; then raise the temperature to 200 degrees, shut off the steam, and allow it to repose for 12 hours; then draw off the tallow, and allow it to get solid, then let the tallow be again melted in a vessel with a steam jacket, at a temperature of 200 degrees, and in a short time it will be quite transparent, and better adapted for candles than tallow that is prepared in the usual manner.

Secondly.—The method of distilling in vacuo all oily and fatty maters, and all bodies derived therefrom. After separating the acids in the usual manner, into solids and liquids, put the solids into a vacuum pan, similar to those used by sugar refiners, only giving a preference to a coke fire, so constructed that it may be raised or lowered at will, either by a rack and pinion, or any other suitable means, whereby the power of regulating the heat is afforded, then apply the heat to the pan, and as the sterim wax passes off by evaporation, add more material until the necessary quantity be distilled.

Thirdly.—The distillisation, and when necessary, the repeated distillisation, under atmospheric pressure, of all fatty acids and their products; by placing them in a retort, under atmospheric pressure, first separating them, if moderately firm, into solids and liquids.

Fourthly.—New mode of separating the fluid from the solid parts of fats and oils. To 560 pounds of carbonate of potassa put 350 gallons cold water, and 280 pounds of lime; boil the above together, then add 20 cwt. of tallow, then boil the whole together for an hour; let it cool, then add as much cold water as will render it the consistency of thin paste, letting the whole be well stirred until it be thoroughly incorporated; then pass the whole through a sieve, that no lumps may escape being broken; then let the whole be put into a filtering apparatus, made in the following manner:—A cistern of a suitable size to hold the material, in the bottom of which are four pipes, each 6 feet long, to give the necessary pressure, communicating with a horizontal pipe, on which are cast several short pipes, to hold the filtering bags; these are made of twilled cotton, 6 feet 6 inches long, and 6 inches in diameter, they are covered by other bags, made of linen, to give them the required strength; on the plugs being removed from the pipes in the bottom of the cistern, the matter in operation flows into the horizontal pipe, and from thence into the filtering bags; the liquid part containing oleric acid, with a combination of carbonate of potassa, and the impurities of the fat then run into a trough, placed for the purpose, and the solid parts, containing margaric acid, and a combination of carbonate of potassa, remain in the bags, and may be easily squeezed out, by having one end of each bag untied.

James Haddin Young, and Andrieu Delecambre, of Lisle, France, *improvements in setting up printing types,* Sept. 9.—The inventors claim—

First.—The use of an inclined plane for the setting up printing types, by the inclination of which, the types placed thereon are conveyed by their own gravity from their chambers to the receptacle, answering the purpose of the composing stick, or any other required point. In the middle of the frame of the machine, is fixed a horizontal bed plate, to which are attached bearings which carry three rows of pins that form the axis, on which three rows of keys (like piano keys) vibrate: these keys are each connected by a joint to an inclined lever; to each lever is fixed an inclined plane, or wedge-shaped piece, acting as quoins, each of which is connected with an open channel, a hair's breadth wider than the type, to allow it to slide freely down from its chambers or receptacles.

Secondly.—The peculiar form and arrangement of the chambers or receptacles for holding the type. These chambers are formed of parallel brass bars, elevated one above another, and mounted on frame work, inclined to correspond with the back of the inclined plane, in the form of a pointed roof, strengthened underneath by cross ribs cast upon it, to support the whole weight of the collected type, and connected by screws to the framing or casing of the machine.

Thirdly.—The pushing frames, and their wedge-shaped pieces, by which the type is pushed on to the inclined plane. There are supports fixed to the under side of the inclined plane; through the lower arms of these supports are slots, through which the upper ends of the levers pass, there are also centre screws, upon the points of which the pushing frames are made to vibrate, in order to push the type from its chambers down the inclined plane; to the arms of the supports are also screwed springs, the points of which press against the pushing frames, that they may recover their former position after the type has been forced out of its chamber, down the inclined plane, which has a groove for each type.

Fourthly.—The hinged piece with its spring.

Fifthly.—The composing box and its various mechanical movements. After the type has been forced out of its chambers, it descends in the grooves into cross channels, and enters the composing box, which answers the purpose of a composing stick. A vibrating spindle extends across the machine, on which is fixed a lever, by a bracket with a parallel bar; near the ends of the keys are fixed vertical arms, and on the keys being depressed, the arms push against the end of a short rod, which acts against the vibrating spindle, and through the lever causes the end of the parallel bar to pass through a hole in the composing box made for this purpose, and come in contact with the column of type that is being formed, thereby making just room for the type that is then descending the inclined plane; at the other end of the column of type is a slider, regulated by a spring, to give the necessary pressure, in order to keep the type sufficiently tight. A small wheel and handle is so constructed as to remove the row of type when finished, one rotation being sufficient, thereby making room for a fresh row.

Sixthly.—The shield. This is a plate covering the grooves and cross channels, in order to keep the type from falling before it reaches the composing box.

ENTERED AT THE ROLLS CHAPEL OFFICE.

(Continued from No. 55.)

William Winsor, Rathbone-place, artists' colorman, *a certain method or certain methods of preserving and using colors,* Aug. 22.—This invention consists in using cylindrical tubes of glass or other substances for preserving colors, in the place of bladders or membranes, now commonly used. These tubes are open at both ends, and have an external rim or border, to admit of any suitable flexible substance being secured over one or both ends of the tubes. Into each of these tubes a piston is fitted, having a female screw formed in its centre, into which a male screw is fitted; this screw is as long, or rather longer than the tube.

The piston is formed of a number of thin circular plates of cork, or other elastic substances, with alternate discs of paper or other similar materials interspersed between them, or it can be composed entirely of plates of cork. These plates or discs have circular or other shaped holes in their centres, which allow them to be arranged upon a cylindrical or other shaped block, made of ivory, metal, or other substances.

This block has a female screw, formed within its centre, to fit the male screw above mentioned, and likewise a circular or cylindrical plate of a larger diameter at one end of it. The circular discs or plates are arranged upon this central block, and secured upon it by means of gum, glue, or other cements, according to the nature of the various colors intended to be contained in the color preserver; so that the cement used in fastening the circular plates shall not be soluble in the liquid with which the color is prepared. The male screw may be made of metal, ivory, or other suitable material, and have a coarse thread formed upon it, from its point nearly to its head; that part being left

solid for the sake of strength, and to affix firmly to it a flat, circular, or other shaped head, to act as a lever in turning the screw.

The piston thus formed is fitted into one end of the tube; a flat circular plate, made either of ivory, metal, or other materials, and which is rather larger in diameter than the tube, is secured upon one end of it, next to the piston, by affixing over it a piece of membrane, such as bladder, &c. This plate has a circular hole through its centre, and through the bladder, large enough to permit the male screw to pass through it without touching the plate. The male screw passes through the holes in the plate and bladder, and works in the female screw formed in the centre of the boss of the piston; it is then turned round within the female screw, until its point nearly reaches the opposite end of the tube, the piston remaining in the tube, near the head of the screw. The tube is then filled with the paint or color.

The end of the tube which yet remains open, is then secured with a flat circular plate, with a hole in its centre, and a membranous material is bound over it; the hole is then closed by a peg, made of ivory, bone, or other material.

When any color is required for use, take out the peg, then give the male screw a few backward turns, and thus withdraw it a little out of the tube, leaving the piston stationary; then push against the head of the screw, without turning it, and thus force the piston forwards; the color will then be driven out through the aperture on to the palette; then replace the peg. This process must be repeated as often as color is required for use.

William Forrester, of Barrhead, Renfrew, *certain improvements in sizeing, starching, dressing, and otherwise preparing warps for weaving fabrics, and the machinery and apparatus therewith connected*, Sept. 7.—Claims, first, the passing of the warp threads into a trough, in a fully extended state, and in that position conducting them into the size trough by rollers so disposed as to prevent them from packing together or drawing into strands. The yarns or warps are passed through a trough containing the dressing or size; the warp is unwound from two warp beams, and passes through reeds, to keep the threads properly divided, when passing to the bearing roller. The copper for containing the size, paste, or dressing, is made of any suitable metal, its outer surface surrounded by a casing, so attached to its edge as to form an air-tight chamber, into which steam or hot water is made to flow, whereby the paste, size, or dressing may be kept to 160 degrees Fah., that being the proper degree of heat. A roller is partly immersed in the hot size, which receives the threads, equally divided from the bearing roller, and so conducts them into the size or paste. Rollers of copper or brass are placed over the warp, so as to immerse it entirely in the hot paste or size, and to exclude the air from the body of each thread, and cause the size, paste, or dressing to enter the body more completely.

Secondly.—The application of a brush or brushes for smoothing the fibres of the threads as they emerge from the sizing trough. These are circular, made to revolve, but flat ones may be made to answer the same purpose.

Thirdly.—The disposing of the threads singly, or at most in pairs, in uniformly divided positions, on the weaving beam, after having been sized.

Fourthly.—The adaptation of apparatus for dressing or sizing two separate wefts at the same time in the same machine. The threads and warps pass through treddles, and a crown reed, that they may be disposed in due order upon the beam. The treddles, crown reeds, beams, and other necessary apparatus are contained in framework. The steam is admitted to the casing of the trough by an inch pipe at one side, and the condensed steam carried off by a half inch pipe on the other side; there is also a safety valve placed in the casing, for the purpose of admitting air in case of a vacuum being formed inside.

ENTERED AT THE PETTY BAG OFFICE.

(Continued from No. 60.)

Joseph Norton, of High Bridge Mill, near Clayton, High Hoyland, York, manufacturer, and George Collier, of Skelmanthorpe, High Hoyland, York, mechanic, *improvements in looms for weaving figured and twilled fabrics*, Aug. 26.—These improvements apply to power and to hand looms. They consist of novel application of machinery, by which the power is given of weaving figured and twilled fabrics without the aid of the Jacquard cylinder, and by which the shifting of the warps both ways is produced; i. e., upwards and downwards, thereby giving a greater number of movements, and, consequently, a greater variety of patterns.

This is produced by an endless chain of tappets, or projecting pins, or studs, which select out and act upon other corresponding depressers, or jack sinkers, according to the reading off of the tappets as required, to produce the required pattern in the cloth.

Joseph Bower, Hunslet, Leeds, *improved method of producing carbonate of soda*, Sept. 3.—The inventor claims the use of bicarbonate of ammonia, and sesqui-carbonate of ammonia, in producing carbonate of soda from a decomposition of sulphate of soda.

Put 200 parts of water, 86 parts of bicarbonate of ammonia, and 100 parts of sulphate of soda, into an iron cylinder containing an agitator; let these be agitated from 18 to 36 hours, when bicarbonate of sode and sulphate of ammonia will be produced; then filter the bicarbonate of soda, and expose it to a red heat in a retort or close furnace, and common carbonate of soda is produced.

To produce the same from sesqui-carbonate of ammonia, introduce a current of carbonic acid gas into the cylinder, while the mixture is being agitated, which will convert free ammonia into bicarbonate of ammonia.

Robert Molyneux, Southampton-row, Middlesex, *improvements in chronometers*, Sept. 7.—The inventor claims the mode of rendering the compensation for the changes of the temperature more perfect, by the application of supplementary compensation.

One mode is by fixing to the inner side of the arm of the chronometer, supplementary compensation pieces, fixed by a screw at one end; at the other end is a regulating screw, and in the balance rim are adjusting screws, the points of which act against the supplementary compensation pieces. Suppose the chronometer adjusted, so that at a temperature of 30 degrees, or 55 Fah., the rim would be circular, and the middle projecting portions of the supplementary compensation pieces banking in contact with the balance rim; if the temperature be raised, the rim would cease to be circular, and the middle projecting portions of the supplementary compensation pieces cease to bank in contact with the rim, and the free ends of the balance rim, with the free ends of the supplementary pieces, would approach the centre of balance, so that by a proper adjustment of the position, weight, length, &c. of the additional supplementary compensation pieces, the most perfect compensation for the higher changes of temperature is obtained.

Another mode is, for changes to a lower degree of temperature. By fixing the supplementary compensation pieces to the free ends of the balance rim, with their middle projecting pieces banking in contact with those free ends.

A third mode is to obtain the most perfect compensation, independent of the balance, by fixing arcs of metal to the arm of the chronometer, by means of screws, and to those arcs, compound arcs of steel, or any suitable metal, similar to the balance rim; but this arrangement is only applicable to the changes to a higher degree of temperature.

Thomas Peet, Bread-street, Cheapside, *improved or peculiar construction of steam-engines*, Sept. 11.—The improved construction applies to rotary engines with two cylinders. The main axle passes longitudinally through the centre of both cylinders, carrying their appropriate eccentrics and cams.

The eccentrics bring down sliding steam stops into the cylinders, and the cams raise them up again out of the cylinders, to allow the piston to pass, in performing its rotary movement.

On the main shaft is also fixed an eccentric, nearly midway between both cylinders, which, as it revolves, acts against a forked lever, the reverse end of which causes a rod and slide valve to move to and fro, to allow the entrance and exit of the steam into and out of the cylinders.

Richard Smith and Richard Hacking, both of Bury, in the county of Lancaster, *improvements in machinery or apparatus for drawing, slubbing, coving, and spinning cotton, wool, flax, silk, and other fibrous substances*, Sept. 11.—The inventors claim,—

First.—The peculiar method of changing the speed of the drawing rollers. By passing a band or strap round the cone pulleys, in connection with the rolling gear, on shifting the strap or band along the conical peripheries of the pulleys, their speed will be easily altered, and thereby vary the draft.

Secondly.—The peculiar construction of a toothed wheel, with a row of teeth or pins mounted on a pinion, that it may be easily changed into a mangle wheel motion. Take a wheel for regulating the length of the cop, with an ordinary run of teeth, let it be worked by a pinion, at the bottom of a diagonal shaft, and as long as the copping rail requires to be lifted, the wheel will continue its ordinary rotary motion, but as soon as the left is completed, any stop or small lever, in connection with the machine, may be made to strike a part of the wheel, and cause it to swivel on its centre pin, and describe a quarter of a revolution, and so leave room in the rim of teeth for the pinion to turn round from the back to the front of the wheel, and so change the ordinary circular motion for a mangle wheel motion.

Richard Smith and Richard Hacking, both of Bury, county of Lancaster, *improvements in machinery for spinning cotton, and other fibrous substances*, Sept. 16.—The improvements consist, first, in the going out of the carriage. On the carriage coming in, a levelled friction pulley is made to pass on to a feathered shaft which then revolves, and by a peculiar arrangement of toothed wheels and pinions, this pulley comes in contact with another bevelled friction pulley, and as long as these continue in contact, the carriage continues to run out.

Secondly.—For the backing off of any yarn that may remain on the upper side of the spindle. This is done by a tappet, fixed on the end of the cam shaft, which, as it revolves, strikes a pin fixed in a slide rod, at the other end of which is an inclined plane, which, as the rod is slidden inwards, strikes a lever connected with the shaft of the winding-on machine.

Thirdly.—The winding-on of the yarn to the spindle. This is performed simultaneously with the running in of the carriage.

Fourthly.—The running in of the carriage. This is performed by separating the bevelled friction pulleys, after the carriage has run out, and by reversing the draft chains.

The principal feature in this improvement is in producing the above four movements by the friction of contact of pulleys or rollers, thereby combining great simplicity with economy of workmanship.

NOTICE.

In accordance with the determination expressed in our 26th Number, of giving one month's clear notice to Inventors, before publishing their specifications, we hereby inform the following Patentees, that their specifications will be published in the "Inventors' Advocate" of Oct. 24. Each party will receive, in addition, a *private* communication to the same effect.

Francis Molineux, of Walbrook-buildings, London, Oct. 23.

ELIJAH GALLOWAY. of Manchester-street, Gray's Inn-road, engineer, Oct. 23.
JONATHAN SPARKE, of Langley-mills, Northumberland, agent, Oct. 23.
JOHN WHITE of Manchester, engineer, Oct. 23.
JAMES MALCOLM RYNER, of Henrietta-street, civil engineer, Oct. 23.

RAILWAY INTELLIGENCE,
DOMESTIC AND FOREIGN.

LONDON AND BRIGHTON RAILWAY.—We hear that the works at the Balcombe viaduct are slackening a pace, and that a formidable rock has been encountered in the tunnel there which threatens very serious delay. At the same time the shares, as we had anticipated, are rapidly going down.—*Brighton Guardian.*

TIMES OF STARTING ON RAILWAYS.—*To the Editor of the Railway Magazine.*—Sir,—Being a resident in the northern counties, and being much up in London, of course I often go by the York line of railway, and as I have noticed a circumstance which has been productive of much inconvenience to me and others, I wish, through your valuable columns, to call the attention of the companies to it that it may be remedied. The line to York is formed by several companies, the Birmingham, Midland Counties, Birmingham and Derby, North Midland, and York and North Midland, and necessarily these several railways, with the exception of the Midland Counties and Birmingham and Derby, work together. Each of the companies publishes its times of running on its own line, and those of other companies, which is all very well, but the mischief is that not two of these bills agree. One company will announce five trains running throughout, another four, and there are discrepancies often of a quarter of an hour in the different bills. This may be partly accounted for by the quarter of an hour stoppage at Derby, but still some degree of uniformity might be preserved, for on the Lancashire lines there is none of this trouble.—I am, Sir, your most obedient servant, A CORRESPONDENT.

A LONG RAILWAY TRAIN.—On Sunday morning, no fewer than 62 carriages, drawn by four engines, left the Leeds station for Sheffield. The number of passengers amounted to 3,200. This exceeds the famous train that left Nottingham for Sheffield a few days before, which consisted of 57 carriages, four engines, and 3,000 passengers.

PARIS RAILWAY.—Three new railway stations, on a large scale, have been constructed at Paris—one for the Orleans Railway, at the Boulevard de l'Hôpital; another for the Versailles Railway, at the Barrière du Maine; and a third for the St. Germain Railway, in the Rue St. Lazare, by the side of the Tivoli passage.—*Railway Magazine.*

PARIS AND ORLEANS RAILROAD.—On Thursday the Duke of Orleans, the Ministers of Commerce and Justice, the Under Secretaries of State for the Interior and Public Works, the Prefect of the Seine-et-Oise, the Marquis de Lamoriclie, as representative of the Prefect of the Seine, General Jacqueminot, and other persons of distinction, made a trip along the Paris and Orleans railroad to Corbeil. They were received there by the sub-prefect, mayor, and municipality of the town. The passages there and back again to Paris, were each made in three quarters of an hour. Invitations have been sent to about 1,500 persons for to-day and to-morrow, and, as we have already announced, the line will be opened to the public on Sunday.—*Paris Paper.*

VERSAILLES AND MEUDON.—The French papers notice the public opening of the railroad between these two places. The ride is one of great beauty, especially on arriving near Meudon. The passage is effected in 28 minutes going, and 22 returning.

RAILWAY ACCIDENTS.

FATAL RAILWAY ACCIDENT.—On Saturday evening last, an adjourned inquest took place, at the Bell Inn, High-street, Brentwood, before Mr. Lewis, the coroner, relative to the death of George Osbourne, aged 34, who was killed on the *Eastern Counties Railway*, on Thursday week last. It appears that the deceased was employed on the railway at Brentwood. On the day in question, he was on one of the engines, and, in attempting to detach it from some ballast-wagons, he slipped between, and the engine passed over his body, completely severing it in two and causing instantaneous death. Several persons were standing at the station at the time, and saw the accident, but were unable to render any assistance. There was no blame attached to the driver of the engine. Verdict—"Accidental death."

NORTHERN AND EASTERN RAILWAY.—On Wednesday morning an accident occurred on this railway, but fortunately unattended with any serious consequences. This railway branches off from the Eastern Counties line at Stratford, and, as a matter of accommodation to the former company, the Eastern Counties company convey some of their early trains to Stratford, where their own engines wait to receive them and carry them forward. On Wednesday morning, at 8 o'clock, the first train for the Northern and Eastern Railway was conveyed to Stratford in this manner, and when it arrived within about a quarter of a mile of the station it was detached as usual by a spring, while the engine and train of the Eastern Counties Railway proceeded forward on its journey. This part of the railway being on an incline of about 1 in 300, the detached train travels for some distance by the effects of gravity and its acquired velocity; and the switches being properly turned immediately after the first train has passed, the detached train runs on to another line of rails which passes to the Northern and Eastern Railway. On this occasion, however, the engine-driver of the Northern and Eastern Railway placed his engine too close to the junction of the two lines; and when the detached train arrived near the spot, the guard made signals to the engine-man to move forward, as he apprehended a collision. These signals were disregarded, and the next moment the train ran against the engine with a violent crash. There were several passengers in the train, some of whom were slightly bruised, but none were seriously injured, and they shortly afterwards proceeded on their journey. The blame appears entirely to rest with the engine-driver of the Northern and Eastern Railway for placing his engine too near the junction, and also for neglecting the signal given by the guard to move forward, which he could easily have done, and thus have prevented the accident.—*Times.*

BRISTOL.—On Sunday evening an accident occurred, which might have been, but fortunately was not, attended with serious consequences. At this end of the line, just by the terminus, there are several lines of rail for the purpose of running the engines up to the engine-house, and to take in water, &c. There are proper switches placed by which to turn the engines from one line of rail to the others. On the evening in question, the Arrow engine had been taken up to the engine-house to wait for the 9 o'clock train, and the man whose duty it was to turn the switch off upon the proper line to Bath had neglected his duty. The consequence was, that when the Lynx with the 8 o'clock train of passengers started, she ran with her train almost at once upon the Arrow, and the collision was so great as to beat down the framework of the latter, and altogether damage her considerably. Several of the second-class carriages in the train of the Lynx were also more or less broken. Happily little hurt, beyond a few sharp bruises, was inflicted upon the passengers. Gorely, the conductor, received some rather severe cuts about the head and face. After an interval of an hour occupied in getting fresh carriages, the train again started with all its passengers, and arrived at Bath in safety. The Arrow has since been repaired, and is now at work as usual. Since writing the above we have received the following statement from authority:—"On Sunday evening, as the 8 o'clock train was leaving the station at Bristol for Bath, on its arriving at a side railway, where the engines are kept in readiness, it was improperly turned on to it. In consequence of this the train was suddenly stopped, which caused some slight injury to the engine. Another engine was immediately attached to the train, which had not sustained any damage, and was not even moved off the rails, when it proceeded to its destination in the usual time."—*Bristol Paper.*

SCIENTIFIC MEMORANDA,
AND
NOTES ON ART.

Petroleum Oil Well.—About ten years since, whilst boreing for salt water, near Burksville, Kentucky, after penetrating through solid rock upwards of two hundred feet, a fountain of pure oil was struck, which was thrown up more than twelve feet above the surface of the earth. Although in quantity somewhat abated after the discharge of the first few minutes, during which it was supposed to emit seventy-five gallons a minute, it still continued to flow for several days successively. The well being on the margin, and near the mouth of a small creek emptying into Cumberland river, the oil soon found its way thither, and for a long time covered its surface. Some gentlemen below applied a torch, when the surface of the river blazed, and the flames soon climbed the most elevated cliffs, and scorched the summit of the loftiest trees. It ignites freely, and produces a flame as brilliant as gas. Its qualities were then unknown, but a quantity was barrelled, most of which soon leaked out. It is so penetrating as to be difficult to confine in a wooden vessel, and has so much gas as frequently to burst bottles, when filled and tightly corked. Upon exposure to the air, it assumes a greenish hue. It is extremely volatile, has a strong, pungent, and indescribable smell, and tastes much like the heart of pitch pine. For a short time after the discovery, a small quantity of the oil would flow whilst pumping the salt water, which led to the impression that it could always be drawn by pumping. But all subsequent attempts to obtain it, except by a spontaneous flow, have entirely failed. There have been two such flows within the last two years. The last commenced on the 4th of July last, and continued about six weeks, during which time about twenty barrels of oil were obtained. The oil and the salt water, with which it is invariably combined during these flows, are forced up by the gas, above two hundred feet, into the pump, and thence through the spout into a covered trough, where the water soon becomes disengaged and settles at the bottom, whilst the oil is readily skimmed from the surface. A rumbling noise, resembling distant thunder, uniformly attends the flowing of the oil, whilst the gas, which is then visible every day at the top of the pump, leads the passing stranger to inquire whether the well is on fire.—*Silliman's Journal.*

Cornish Engines.—A deputation from the Dutch government having visited Cornwall, in order to ascertain by actual inspection whether the duty performed by the steam-engines employed in the mines is equal to what is stated in the monthly reports, the adventurers and agents of the undermentioned mines kindly permitted an experiment of six hours to be made on their several machines, and the duty as stated below was the result:—Wheal Vor, Borlase's engine, 80 inches single, 8,0 feet stroke, 123,300,593 lbs. lifted one foot; Fowey Consols, Austen's engine, 80 inches single, 9,0 feet stroke, 122,731,766 lbs. lifted one foot; Wheal Darlington engine, 80 inches single, 8,0 feet stroke, 78,257,765 lbs. lifted one foot; Charlestown United Mines, 50 inches single, 7,5 feet stroke, 55,912,392 lbs. lifted one foot; Charlestown United Mines Stamping Engine, 32 inches single, lifting 66 stamps, 60,525,000 lbs. lifted one foot; Wheal Vor Stamping Engine, 36 inches double, lifting 72 stamps, 50,085,000 lbs. lifted one foot.—*Lean's Engine Reporter.*

New Process for making Sulphuric Acid.—M. Provostaye, of Paris, has proposed the following process:—He recommends introducing into the leaden chamber sulphuric acid, nitric acid, and the vapor of water. To understand what takes place under these circumstances, a current of sulphurous acid may be passed into a flask, containing nitric acid; this should be made, by means of a bent tube, to communicate successively with a flask containing sulphuric acid, a globular vessel, moistened with water, and a dry globe. The nitric acid is completely decomposed. The first flask contains pure sulphuric acid alone. Red vapors pass from the first vessel into the second: this is filled with sulphurous acid also, for it is formed of solid white crystals, in the two last experiments, as in the first. In the latter, all the sulphuric acid of the second flask exists in a solid crystallised mass, of a greenish yellow color. The re-actions are, therefore, similar to those of the old process. In the new process, the nitric acid yields a portion of its oxygen to the sulphurous acid, in order to convert it into sulphuric acid. Hyponitric acid is thus formed, which acts like the hyponitric acid in the old process, which is formed from the binoxide of azote and oxygen of the atmosphere—that is to say—successively it yields oxygen to the sulphurous acid, and borrows it from the air; but the discharge requires the

intervention of sulphuric acid and water. The water has two very distinct functions; it acts directly, by bringing into more intimate contact the sulphurous acid and hyponitric acid, and this favors the oxidation of the first by the oxygen of the second: it acts also, by decomposing the white crystals immediately, and changing them into sulphuric acid and oxide of azote.

Paragrèles.—The destruction caused by the hail storms in the south of France is well known, and the connection of those storms with electrical phenomena having been ascertained, lightning conductors are now erected in the fields for the purpose of drawing down the electrical fluid, and thus dissipating the storms. These conductors, though of considerable utility, do not prove sufficiently protective, owing to the insufficiency of their height. M. Romas, lately made some experiments with a paper kite, and a metallic string, with a view to ascertain the effect of taller lightning conductors. His experiments, as described in the *Journal des Arts Agricoles*, appear to be very remarkable, from the immense quantity of electrical matter which the apparatus attracted. His kites were raised to a height of about 180 yards, and during a very trifling storm M. Romas drew from the end of his apparatus not sparks only, but streams of fire nine or ten feet long, and one inch in width, which made as loud a report as a pistol. It was observed that during these experiments the thunder entirely ceased. Other persons who have tried similar experiments, found that by keeping the kites in the air storms were greatly abated. These experiments will, it is supposed, afford the means of protecting those agricultural districts which are now most exposed to the ravages of hail storms. The damage done by hail in 1836 and 1837 is estimated at 37,739,000 frs. in each year, and in 1838 it was nearly double that amount. In 1839 the damage done by hail storms was still greater. It was estimated at nearly 250 millions of francs.

VARIETIES.

Another Discovery of Roman Coins.—A very interesting discovery was made on Saturday last, by some persons employed in brickmaking near the landmark, about a mile and a half from Fleetwood, by their finding between 300 and 400 Roman coins, which appear in an excellent state of preservation. The coins, it seems, had not been perceived by the laborers until the clay had been so much worked as to be nearly ready for the moulder; it is therefore by no means unlikely that many of the specimens have been already mixed up with the bricks that have been made, and consequently will remain undiscovered for many years to come, if they are ever found at all. They are of various reigns, and rather larger than our sixpence. We have seen specimens of those of Adrian, Nerva, Marcus Antoninus, and Sabina, and among the whole number there will no doubt be many more varieties. It is stated that about 150 of the coins have been sent to Rossal-hall, and we suppose the rest have got dispersed among the curious in such things. This discovery will, we should think, afford satisfaction to the Rev. W. Thornber, the historian of Blackpool, confirming, as it does, in a very remarkable manner, the opinion so confidently expressed by him, of Blackpool having been at one time a Roman station or settlement. As no pains will now be spared in making further discoveries of these interesting relics, it is not at all unlikely that we shall have to bring the subject again before our readers at no distant period of time.—*Preston Pilot.*

New Floating Fire Engine.—On Saturday, the new floating fire-engine was launched from Blackwall, and moored off Southwark bridge, where its force was tried; it is nearly four times the power of the other two, and throws two tuns and a half of water per minute to a height of 120 feet. The hose are of vast size, and it requires two powerful men to hold the branch pipe. The float is rowed by 18 oars, and can be conveyed to any place with the utmost celerity, and will require 130 men on board to work the engine.

A Very Beautiful Fossil was shown to us this week, obtained from the limestone at Lamonby, in Castle Sowerby. We have learned that it is a specimen of the Spirula, chambered shell of an animal, which, in common with those of every species that have found their stony graves in the secondary strata, is no longer to be met with as a living inhabitant of our planet.—*Carlisle Journal.*

Austrian Censorship.—Printed books are divided into four classes: 1st, *admittitur*, may freely pass: 2nd, *transeal*, may be sold, but not advertised or exhibited for sale: 3d, *erga schedam*, may be delivered to safe and trustworthy persons: 4th, *damnatur*, prohibited. The same classification holds good with respect to manuscripts, for which, however, there is a fifth class; "*typum non meretur*, unworthy of being printed." "In this class," says the law "are included those wretched worthless books, the subject of which is without interest, and at variance with all good sense, as well as other miserable productions, which violate good taste, the rules of style, and the purity of language." A catalogue of the newspapers allowed to be imported, is yearly drawn up at Vienna, and the Vienna papers are held up as a model by which those of the interior are to fashion themselves. The law says, "They ought to be attractive, true, and circumspect." The theatres also are subject to a strict censorship, since much may be printed that must not be performed. Sanguinary and inhuman pieces must be rejected, and modesty is enjoined in gestures, dances, and costumes. A worthless king must not be presented as the principal character, unless there be a good and just king in the same piece to counteract the evil impression produced by the former. Five copies must be delivered of each book. No one is allowed to cause any work to be printed in a foreign country. This prohibition extends also to articles and letters in foreign newspapers and periodicals. Books on ecclesiastical law and ecclesiastical history are not referred to the bishops; but other theological and religious writings are submitted to them for approval. In case of a difference of opinion between them and the censors, the question must be referred to a superior authority.—*Raumer's Italy.*

Lunar Rainbow.—This interesting phenomenon was witnessed on the evening of Wednesday last, about three quarters of a mile from town, on the Liberton road. The eastern limb of the arch seemed to rest on Salisbury Crags, well nigh the middle of the ridge—the western on Blackford Hill: the city, dimly lighted by the moon, and relieved against an intensely dark cloud, stretched below. The apparition was one of singular though spectral beauty. The stronger prismatic colors—the violet, the green, and the crimson—were distinctly visible, somewhat steeped in yellow, and shorn of their wonted brilliancy, but exquisitely soft and delicate; the others were lost in the prevailing tints of tawny and pale.—*Caledonian Mercury.*

Extraordinary Vitality of Seeds.—On Wednesday evening, at a lecture on Egyptian antiquities, delivered by Mr. Pettigrew, in the City of London Literary and Scientific Institution, the lecturer exhibited some wheat found in a tomb at Thebes by Sir Gardener Wilkinson, which must have lain there for thirty centuries. The seeds were found in a vase hermetically sealed. He had sown twelve seeds, out of which he obtained one plant, which had grown five feet high, and the seeds of which were now perfectly ripe.—*Times* of Tuesday.—*To the Editor of the Times.*—Sir,—The paragraph in your paper of this day, respecting the extraordinary vitality of seeds is not entirely accurate. The seeds brought from Egypt by Mr. (now Sir Gardiner) Wilkinson were not planted by Mr. Pettigrew, but were given by that gentleman to Mr. F. Tupper, of Aldbury, in Surrey, who made the interesting experiment alluded to, in his own garden in that village. Out of the twelve seeds planted only one became productive; the others, not showing any signs of germination, were picked out of the mould, and found to be rotten and wormeaten, and a number of minute white worms, the issue, possibly, of revivified Egyptian ova, were discovered about them. The plant which germinated has produced two ears; one of which, having ripened, was gathered, and is preserved with great care. The other is yet growing on the stalk. It appears to be of a more vigorous character than the ripened ear, which is somewhat more than two inches in length. The twelve seeds were planted in four pots on the 7th of March last, and the first blade of that which germinated became visible on the 22d of April. I forbear to say more on the present occasion, as it is probable that Mr. Tupper (to whose friendly communications I am indebted for the above facts) may be himself induced to favor the public with further particulars on this very curious subject.—I am, Sir, your obedient servant, EDWARD WEDLAKE BRAYLEY.

September 21, 1840.

The Austrian Government has published a decree in favor of the trade in books, and of foreign objects of art. The duty on the importation of books indeed remains the same, viz., at 5 per cent., but in this duty is comprised all the engravings, maps, lithographs, &c., which were previously subject to a duty of 60 per cent. This duty on objects of art not contained in books, such as drawings, engravings, &c., has been reduced to 10 florins per cent., and that on paintings to 5 per cent. The export duty on all similar objects, without distinction, will be about 11 French sous per cent.

Curious Phenomenon.—A piece of birch has been left for inspection at our office, in the heart of which two large nails, in an inverted position, have been imbedded. This curious phenomenon was discovered during the process of sawing up a log of the wood mentioned, at the timber-yard of Mr. M'Kune, of Ballymacarrett, near Belfast, and is well worth inspection, as a singular illustration of the manner in which extraneous substances occasionally find their way into timber. The tree in which the nails were found, was 15 inches in diameter, and it is supposed that their introduction was originally owing to an ancient superstitious mode of curing the toothache, which was occasionally resorted to by the Irish peasantry in former times.—*Belfast News Letter.*

The India Steam-ship.—This beautiful specimen of naval architecture took an experimental trip on Tuesday, from Blackwall to Sea Reach, for the purpose of trying her machinery, prior to her departure to day for another hemisphere. The India has been more than once described, and it will be only necessary, therefore, for us to say, that alterations have been effected, throwing a portion of the width of the saloon into the private cabins, and making them drawing-rooms in miniature, rather than mere ante-rooms for the passengers. The deck has been raised nearly two feet, and thus the saloon is the loftiest we remember to have seen, and the cabin, or, as our East India friends would term it, the cuddy, is the most airy apartment in the vessel. The day was unpropitious for such a trip; it was, in fact, a regular soaker. Hopes were entertained that at noon the sun would burst through the clouds which impaired its brilliancy, and that a glorious evening might compensate for the disappointment of the morning: it was not to be;—rain, unpitying and unrelenting, interfered with the contemplated arrangements, and ultimately no fewer than 60 or 70 gentlemen were compelled to amuse themselves as they best might beneath the spacious decks, which, under more favorable auspices, would have been a delightful promenade. The experiments were upon the whole satisfactory. The vessel maintained the average speed which she ought to have kept up had she been laden, and the inspection of the machinery afforded the greatest gratification to the gentlemen present, most of whom joined the company at breakfast on Tuesday morning. On arriving in Sea Reach, various manœuvres were resorted to, with a view to test the capabilities of the India, and all of them were attended with a satisfactory result; to use a nautical phrase, "She behaved herself well."

New Aqueduct at Dijon.—It is stated in a letter from Dijon, that the experiment made there of the aqueduct which is to conduct the water from the fountain of Rosoir to Dijon, a distance of 12,610 metres (about 13,700 yards) completely succeeded. Crowds of people assembled on the day the aqueduct was to be opened to wait for the coming of the water, which was three hours and a half in flowing through that distance. The mayor and civic authorities attended the fête which was given on the occasion.

The Late Mr. Cockerill.—The Belgian government has given directions for the body of M. J. Cockerill, who died at Warsaw, to be brought to Belgium. It has also been ordered that funeral honors shall be rendered to his remains on their entry into the Belgian territory.

The Smoke Nuisance from Steamers.—Complaints are constantly made by the public against the nuisance and annoyance created by the vollies of smoke which sweep across the bridges from the steamers, as they pass up and down the river. Several remedies have been advised to avoid that nuisance, and among others the burning of coke and wood instead of coal. Without any such substitute this evil can be easily abated, and a great saving of fuel effected by a slight attention to the manner in which the furnace is fed. Captain Walker, who had for years been engaged in the command of steamers, felt very much the annoyance experienced by large discharges of smoke from the chimneys, but which he obviated by the following simple plan. Instead of heaping on the furnace large quantities of fresh coal, he had the red embers carefully raked down and spread over the furnace. He then heaped a quantity of fresh coal at the mouth of the furnace, the smoke from which was consumed as it passed over the burning coals before it reached the chimney, and thus he continued from time to time to supply the fuel, whilst not the slightest appearance of smoke showed itself, and a saving of 24 per cent. was secured to the owners. Having been convinced not only of the great utility and practicability, but also the great saving of such a plan, he invariably enforced its adoption, by discharging his engineer whenever the steamer displayed a black pendant.

Another Fearful Earthquake.—St. Petersburgh, Sept. 11.—The *Abeille du Nord* of yesterday published the following letter from Teflis, the 13th of August:—"You have doubtless heard of the terrible earthquake of Mount Ararat, which has totally destroyed the town of Nakitchevan, damaged all the buildings at Erivan, and desolated the two districts of Scharour and Sourmata in Armenia; all the villages in those districts have been destroyed. The earth is rent in such a manner that all the cotton and rice plantations have perished for want of water. But the most awful event has taken place in the neighborhood of Mount Ararat. A considerable mass was loosened from the mountain, and destroyed every one in its way for the distance of seven werst (nearly five English miles.) Among others, the great village of Akhouli has had the fate of Herculaneum and Pompeii; above 1,000 inhabitants were buried under heaps of rocks. A thick fluid, which afterwards became a river, ran from the interior of the mountain which was opened, and, following the same direction swept over the ruins and carried with it the corpses of the unfortunate inhabitants of Akhouli, the dead animals, &c. The shock continued to be felt every day in the above-mentioned districts, and entirely laid them waste; then the shocks became less frequent. Ararat is not yet quiet; the day before yesterday I was awakened by two violent subterranean commotions."—*Journal de St. Petersburgh*, Sept. 12.

Balloon Exhibition at the Birmingham Festival.—On Tuesday evening, in the interval between the musical performance, Mr. Gypson, the aëronaut, ascended with his handsome balloon from the grounds of the Crown Inn, Birmingham, in the presence of a large concourse of spectators. On this occasion he brought into operation his new safety valve, of which a description was lately given, so placed at the top of the balloon that on nearing the earth after an ascent, the machine can be at once exhausted of the gas and rendered stationary, without the risk of rebounding or dragging along the ground, as formerly. Some improvements had rendered the valve perfect since its previous exhibition, and the aëronaut so confidently relied upon it, that, considering the grappling-iron and cable unnecessary incumbrances, he ascended without them, taking instead an additional quantity of ballast. After a pleasant voyage he, and a fellow-traveller from Birmingham, arrived over Martocke-park, and by means of the new valve were enabled with the utmost facility to descend, from an elevation of half a mile, within 50 yards of Martocke Castle, where they alighted with perfect safety, much to the gratification of the owner, the Hon. Captain Dilke, and a party of the nobility and gentry who had just returned from the musical festival. The travellers were most hospitably entertained at the castle, and afterwards returned to Birmingham.

Hall's Patent India-rubber Goloshes.—This is an article of luxury and comfort which we cannot too highly recommend. In appearance, it bears a close resemblance to morocco leather; it is perfectly impervious to wet; lined with the softest material; and of so light a weight withal, that when placed over a boot or shoe, the wearer perceives very little sensible difference. Now that the winter is fast approaching, we cannot too strongly commend the Patent India-rubber Goloshes. For invalids, and indeed all persons who have cold or tender feet, or are exposed to the inclemency of the weather, they are especially adapted. Their shape is elegant and their durability great,

GRATUITOUS COPIES

of our Journal have been forwarded to a number of Individuals interested in some Patent, or Invention, of which notice has been taken in our number of to-day.

TO CORRESPONDENTS.

We shall, at all times, be ready to ANSWER QUESTIONS *that may be put to us, relative to any of the subjects indicated in our title; and questions put during the current week, will be replied to either the same, or following week.*

"THE INVENTORS' ADVOCATE, *and* JOURNAL OF INDUSTRY," *may be forwarded,* postage-free, *to all the undermentioned places:—*

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For the convenience of persons residing in REMOTE PLACES, *the* "INVENTORS' ADVOCATE," *will be regularly issued in* MONTHLY PARTS, *stitched in a handsome wrapper.* PARTS 1 *to* 15, ARE NOW READY.

ADVERTISEMENTS *should be sent in not later than* Thursday Evening.

TWO *numbers of the* "INVENTORS' ADVOCATE" *(Nos.* 48 *and* 49*) were published* July 4. *The former contains, in addition to the usual varied matter, the* TITLE PAGE *and a* COPIOUS INDEX *to the* SECOND VOLUME.

VOLUME II. *of the* "INVENTORS' ADVOCATE," *handsomely bound, is* NOW READY. *A* FEW COPIES *of the* FIRST VOLUME *still remain on hand.*

"W. Elliotson."—*It will give us great pleasure to receive the promised article. If it requires the alteration hinted at, we shall be happy to act as requested.*

"T. Newsome."—*There is no reason why the* title *of the invention should not be the same. An application for the new patent may be made at once; should any objection be raised, you can explain exactly how the case stands, and there will be no further difficulty.*

"W. T."—*Yes; by granting the proposed licenses.*

Our weekly article on "the DRAMA" *is necessarily omitted, to make room for the* "Proceedings of the British Association."

The Letters of Mr. Utting, and Lieut. Morrison, R.N., *are in type, and shall appear next week.*

"C. R. T."—*Our Correspondent's letter came to hand too late for further notice in the present number.*

TO INVENTORS.

ALL PERSONS who may be desirous of TAKING OUT PATENTS, or of bringing VALUABLE INVENTIONS into USE, are requested to APPLY to the PROPRIETORS of "THE INVENTORS' ADVOCATE," (DELIANSON CLARKSON) at their "PATENT AGENCY OFFICE FOR ALL COUNTRIES," 39, CHANCERY LANE, where they may be consulted, daily, relative to the PATENT LAWS of GREAT BRITAIN, and ALL OTHER STATES. (See ADVERTISEMENT on the last page of the present Number.)

THE
INVENTORS' ADVOCATE,
AND
JOURNAL OF INDUSTRY.

SATURDAY, SEPT. 26, 1840.

In a former article, in which we enforced the necessity of forming a body of engineers, capable, by their skill and good conduct, of being entrusted with the superintendence of a train of carriages on railways, we expressed our fear that the subject would not be properly attended to until some terrible accident occurred, to show the danger of trusting the lives of hundreds of human beings to the care of persons whose emoluments and position in society are quite inadequate to ensure the ability and responsibility which the situation requires. The recent numerous accidents on railways have been the means of directing attention to the insecurity at present afforded by railway conveyance, and to the adoption of means for preventing such accidents in future; but we still fear it will require more fatal experience than any we have yet obtained, of the inefficiency of the present system, before a thorough, searching, and adequate reform will be established.

We perceive that the government have sent Commissioners to examine the state of the Eastern Counties, and of the Hull and Selby railways, at the places where the late accidents occurred. This is well; as a symptom that the notice of the government has been at length roused to the subject; but in other respects we consider such an inspection of little practical use. The question, as to the best method of laying down the rails, which is yet a matter in dispute among engineers, cannot be determined on an inspection by government commissioners. It is to be decided by experiment and practice. As to the manner in which the work is done; the credit of the engineer and contractors, and the interests of the company, afford a better guarantee than any inspection. Though differences of opinion may exist as to the plans to be adopted; yet, as there are responsible, and usually competent parties engaged for the planning and execution of the work, and as it is the interest of the directors to see that it is well done, this department of railway management, we conceive, requires less supervision than any other.

It is the mode of *working* railways that most requires amendment, and we are fearful that, by directing attention to points of less urgency, the more essential points may be disregarded.

Several plans have recently been suggested for the purpose of either preventing the carriages from running off the rails, or of diminishing the danger to the passengers in case they do. These plans deserve to be seriously considered; for hitherto there has been no material improvement made in the mechanism of railways for increasing security, and it continues now in the same state as when first adopted, without having then any experience of the numerous dangers to be encountered and provided against. The speed proposed to be attained when railways were first constructed was not one-half that which has now been found practicable by locomotive engines; and yet no suitable adaptation has, we believe, been made in the rails, or flanches of the wheels, or in the other precautions against accident which the greatly accelerated speed must have rendered necessary.

It appears to us, for instance, that the present rails are much too slight to bear the weight and the draught of the engine: the constant repairs they require confirm this opinion. We have on a former occasion contended, that the flanches of the wheels are also much too small. They seem altogether inadequate to retain the wheels on the rails should any obstruction present itself, when the engine is in rapid motion. The present flanches appear, indeed, not fitted for a speed of more than six miles an hour. When we see the very small check which now retains the wheels on the rails, and consider the numerous chances there are of obstructions occurring on a long line of rails, it seems wonderful that the engines should not more frequently be forced off than they are.

The mechanical arrangement of the rails and the carriages, for security against danger, is in a most imperfect state, and nothing but the fortunate chances which attended the running of railway trains in the first instance could have prevented a complete change in their construction. An opinion was, indeed, at one time entertained, that as the wheels of the railway carriages are so small, and the centre of gravity so low, compared with a loaded stage-coach, they could not be over-

turned. The fallacy of this opinion has lately, in many instances, been fatally experienced. Now that, in consequence of these accidents, public confidence in the security of railway conveyance begins to be shaken, it becomes the duty of the directors of railroads, for their own interest, as well as for that of the public, to attend to every mode of preventing such occurrences in future.

The methods proposed are of two kinds. First, those having for their object the prevention of accident; and secondly, those for the diminution of danger when accidents occur. Those recommendations we have already suggested, of increasing the flanches of the wheels and appointing more efficient engineers, are precautions of the first kind. Most of the plans recommended in the public papers, refer to the diminution of danger when accidents occur. Of these the most feasible is the plan recommended by Mr. George Walter, late managing director of the Greenwich railway. A fatal accident, from the overturn of a carriage on that line, having proved that the carriages were liable to be upset, Mr. Walter had the whole of them altered, to throw the centre of gravity still lower, and he had props or sledges placed under the bodies of the carriages, so that if the wheels got off the rails, or the axles or wheels broke, the weight of the carriage would be immediately supported on those sledges, and the risk of an overturn has greatly diminished. This plan has been for some time past put into practice, and been found to answer most completely. There can be no doubt it must add materially to the security of the passengers; and therefore, in the absence of any more efficacious plan, it ought to be adopted without delay. In cases of collision, indeed, it would be of little avail, but if it afford protection against one form of danger, it ought to be carried into effect. With respect to collisions, which arise generally from negligence or misconduct on the part of the engineers, some protection might be afforded by alterations in the construction of the carriages; but after all, the best security against accidents must be sought in the appointment of competent responsible officers to the management of the engines.

ON THE MEASUREMENT OF PRIMARY FORCES.

The considerations in which we have been lately engaged, respecting the moments of action of pressures and resistances, are not confined to the verification of abstract principles, but are capable of very extended practical application. We have shown that pressure and resistance have, like motion, their times of action, and that the question of duration is an essential element in this consideration. By viewing those forces in reference to the time during which they are exerted, we have been enabled to explain on an intelligible and simple principle, several phenomena which have been the subjects of lengthened discussion, and which have given rise to much acrimonious dispute among scientific men. We have shown, also, the application of this principle to explain the diminution of friction, in proportion to the space traversed, by increased velocity.

Now, if motion diminishes the pressure on any given point and if the pressure of a body requires a given time to operate, it is evident that there must be certain regulated times for the action of this force. We are not, at present, prepared to state what minute division of time is required to give full effect to the weight of any body on the spot whereon it rests. The question might, perhaps, be deduced from the data of the relative diminutions of pressure corresponding with increase of motion; for, if our position be correct, it diminishes in proportion to the increase of velocity. The question of the amount of absolute weight removed by motion, will, however, be much more satisfactorily proved by experiment. No experiments of the kind, that we are aware of, have yet been made for this purpose. It is a subject well deserving the attention of scientific inquirers, and we shall be glad to hear that it has been pursued; for we feel persuaded it is a field of research which will amply compensate the cultivators. The question to be determined is not a barren principle leading to no results, but it may be the means of throwing light on numerous phenomena connected with every department of science.

We have hitherto considered the principle, that the amount of any force must be measured by the time of its action, as applicable only to the force of gravitation, and to the resistances or pressures of solid bodies. We believe, however, that it may also be applied to all other forces, or original emanations participating in the nature of forces, within the range of human knowledge. The same principle has, indeed, been long since applied to explain certain phenomena of light and vision. It is known, that an object must remain a certain time in the field of view before any sensible impression can be produced on the retina. The cause of this has been attributed to peculiarity of the organs of vision; which, it is supposed, require the impression of an image a certain length of time before they become sensible of the action. It may also be equally attributed to the properties of light; which, it may be supposed, requires a given time to produce its full effect. In either case, an analogous admitted fact is established, confirmatory of the principle we have endeavored to enforce. The undulatory theory of light, also, affirms that the times of action of the waves of the luminiferous fluid determine the nature of the effects produced. The numbers of vibrations requisite to produce the sensation of different colors have been estimated with apparent accuracy and much confidence, though the immensity of the numbers surpass our powers of comprehension, and seem almost to throw doubt on the means of calculation.

This mode of viewing the effects of light, in reference to the times of its action, more especially as relates to the phenomena of vision, confirms the theory we have endeavored to establish regarding the actions of mechanical forces. The same theory is, we believe, also applicable to magnetism, electricity, heat, and even to chemical action. If, by pursuing this course of inquiry, experimental philosophers are enabled to ascertain the times of complete action in each of the forces; to measure the motions of the molecules of bodies, and then to estimate the diminution of force consequent on those motions;—they would open entirely new and more searching views into the processes of nature, and establish still more closely the connection of the Physical Sciences.

NEW INVENTIONS.

HALL'S PATENT HYDRAULIC BELT.

We have more than once had occasion to notice this valuable invention, and to speak of it in high terms of praise. We have now to record the result of an experiment for draining land, just made with the belt at the Fens, near Downham Market, Norfolk. The account is copied, or rather abridged, from the *Cambridge Advertiser*:—"This important and interesting experiment was witnessed by a great number of professional gentlemen and persons connected with the fens, and the indisputably successful result excited the highest satisfaction. It was evident to those who looked on this simple, but powerful agency, accomplishing effects which have hitherto been performed, at a vast expense, by an elaborate, and by no means perfect machinery, that a new era, about to realise the most sanguine hopes of those by whom the full importance of the object was estimated, was dawning on the prospects of fen drainage. From the time when the power of steam was first adapted to the draining of land, but slight advantages have been taken of its introduction beyond the mere

rescue of certain districts from the capricious dominion of the winds. Cast-iron scoop-wheels have been partially substituted for the old Dutch wheel, and various other improvements have from time to time been made; but it must be acknowledged, that, in the adaptation of steam-power to drainage, very many of its most advantageous effects are left undeveloped, and the greatest amount of benefit, at the least possible expense, still left unsecured. It would be needless to describe the many evils which are inevitably attendant on the system of wind-engines for the purposes of artificial drainage. Setting aside every other, the one great objection must always remain insurmountable. Their powers, however great and effective when in action, are dependent on the changeable and uncertain winds. The farmer, in the midst of his confidence and hopes, with his crops ready for the sickle, may experience sudden and complete ruin, from an unexpected fall of heavy rains, deluging his lands—while his mills, his only hope, stand with their sails unmoved by a breath of wind, and the fruits of the labor and industry of the past year perish on the ground. When most depends on the mill, they are often totally useless. At times when there is most rain, there is commonly the least wind. The steam-engine is certain—its giant power untiring. It puts forth its mighty strength whenever it is required, and continues, unceasing, exhaustless, independent of all the obstacles of nature, until its task be finished. The first cost and subsequent expense of the maintenance of one powerful steam-engine is less than the expense of building, repair, and attendance on a great number of windmills. Districts which formerly employed five-and-twenty mills are now effectually drained by one steam engine. Deeping Fen, near Spalding, containing about 25,000 acres, where there were forty-four mills for lifting the water, is now drained by two engines of sixty and eighty-horse power. March West Fen, comprising about 4,000 acres, is drained by a single engine of forty-horse power. Littleport Fen, near Ely, of 28,000 acres, was formerly imperfectly drained by seventy-five wind-engines. Two steam-engines, of thirty and eighty-horse power, have now secured the farmer from the irruption of the waters, and rendered him independent of the winds.

"With these stupendous results before us, it may be asked, why the adoption of steam-engines is not universal? The expense of the first cost of the erection is not the only answer, but it is the one most commonly and forcibly urged. The introduction of steam must be considered merely as the commencement of improvement. Its inexhaustible powers have hitherto been rendered subservient only to the old and imperfect system of wheel-draining. Great as has been the saving of expenditure, and magnificent as have been the results achieved, it is yet evident that much remains to be done before the great work of drainage can be perfected. The moving power has been brought into operation, but it is still left to adapt to this power a machine which is in all respects efficient, and which possesses the invaluable requisites of cheapness and simplicity. Such a discovery was alone wanting to render the incalculable powers of the steam-engine, as adapted to the drainage of lands, available to their full extent, and thus to realise the fondest anticipations of those persons who have been alive to the immense national advantages which would result from a complete system of drainage.

"That such a discovery has been made, the experiment of the application of Hall's Patent Hydraulic Belt, or Water Elevator, on Wednesday last, leaves no doubt on the minds of those who witnessed it. We proceed, therefore, to give our readers as full an account of this most important and interesting trial as is in our power.

"Salter's Lode (not a mineral lode, but, as we understand it, a marshy fen), where the experiment was made, is two miles from Downham Market. An engine has been erected here, and, under the superintendence and at the expense of Thomas Dyson, Esq, the engineer to the Bedford Level Corporation, arrangements were made for adapting the hydraulic belt to the engine. At twelve o'clock a considerable number of persons, between two and three hundred, from the fens, from the metropolis, and from distant parts of the kingdom, had assembled. The greatest interest in the proceedings was displayed by those present, and the engine was no sooner set in motion than the expressions of wonder and admiration at the extraordinary effects of so apparently simple a machine, were loud and general.

"The belt is composed of a woollen material, passing over two cylinders of wood at a certain distance from each other. Any number of belts may be employed, according to the body of water to be raised. By the mere velocity of the belt, a sufficient power of attraction is produced to raise the water, and throw it over the top cylinder. For the purpose of the experiment, the engine was made to employ about three horse power, and with this extent of force more than 800 gallons of water raised per minute, at a lift of about twelve feet. The superiority of the belt over the ordinary mill, was sufficiently attested by the comparison the spectators were enabled to make by the keeper of a wind engine near setting it in motion. This mill was of twenty-five horse power, and at the time of the commencement of its operations had the advantage of the water running off, by the belt raising the water to its level; yet the greatest lift did not exceed two feet, nevertheless it raised no more water than the belt worked, as before mentioned by the engine, at three-horse power. In the opinion of the engineer, the additional outlay of but £75 would serve to raise 2,500 gallons of water per minute, instead of 800.

"The success which attended this experiment of the hydraulic belt, most gratifying as it must have been to the inventor, proved scarcely less so to those persons assembled to witness it, who were capable of estimating the extent of utility to which it might be made serviceable, and of appreciating the advantageous improvements it is capable of effecting in the great work of fen drainage. That a degree of opposition may be offered to the introduction of this beautiful invention, in the fens, is what may be expected, from its militating against the class-interests at present connected with the old system; but such opposition will do little against the weight of the influence of the experience of practical benefit, or against the commendation of men of great scientific eminence. The hydraulic belt has received the sanction of the most celebrated engineers of the present day; and the confidence expressed in the certainty attending its adoption, inspires us with the hope that the time for a great and most renovating revolution in the drainage of the fen is approaching."

FOOTE'S FIRE ESCAPE.

The police committee of the Corporation of London, met, a few days since, at the Guildhall, for the purpose of taking into consideration the reference made to them by the Court of Common Council, upon the motion of Mr. Lott, "to consider the best means of providing escape from fire," in consequence of the late numerous dreadful calamities.

Mr. Deputy Hicks was in the chair. The commissioner of the City police was present, and the committee was also attended by Mr. Lott, the mover of the reference, and a great many respectable persons, who had humanely devoted their time and talents to the invention of machines calculated to effect so desirable an object.

On this occasion, the invention of Mr. Foote, of Feversham, called the "fire detector," was exhibited, being an apparatus applicable to a common clock, to create an alarm by the ringing of a bell set in motion by the increase of temperature. The susceptibility of the engine is stated to be so delicate, its mode of action being thermometrical, that the heat contained in a volume of smoke, arising from the burning of the smallest piece of furniture, will instantly cause it to give the alarm, nor will it relapse into inactivity until the works are destroyed. It may either be attached to a clock, or it may stand alone, and in either case can be made to communicate, by means of wires and cranks, with any number of clocks in near or remote parts of the building. It can also be connected in a similar way with a large alarm bell, such as are seen on the exterior of old mansions, and thus rouse a whole neighborhood. The apparatus excited a great deal of curiosity. Many of the designs developed much skill, and in the opinion of the committee were highly creditable to the inventors; but as the committee were occupied during the whole day in the investigation, and did not come to any determination as to the plan they would finally recommend for adoption, it was not considered by them an act of justice to the parties to particularise the nature of their inventions.

Simplicity of design in its ready adaptation to the various and sudden emergencies, combined with safety in the descent, appear to be the great requisites, and it is hoped that the corporation will succeed in accomplishing an object of such paramount importance.

MOTLEY'S NEW LAMP.

We have been much gratified with the sight of Mr. Motley's very simple yet ingenious machine—a lamp for burning tallow or other inflammable concrete substances, producing a light nearly equal to gas, at half the expense of sperm oil, and nearly as cheap as the commonest fish oil, thus doing away with the very reasonable objection which applies to oils, especially of the common kind. Mr. Motley, we understand, has taken out a patent, and, as far as we can judge, he will be amply compensated for his expense and trouble. The light is beautiful, resembling gas-light, but without the intense heat. The machinery of the lamp is extremely simple. Any one can trim it in a few seconds.—*Sun.*

IMPROVED MODE OF MANUFACTURING GAS, AND PREVENTING SMOKE FROM COAL FIRES.

Various methods of producing inflammable gases, by the decomposition of water by means of ignited carbon, in which both the elements of water (oxygen and hydrogen) combine with the carbon, have been lately brought before the public. The simplest, and most effectual plan is by passing steam through the retort charged with coal. In this way, any coal, even anthracite, which contains no gas whatever, may be made to produce gas of the finest quality. This plan has lately been adopted with great success in the Paris gas works, and has been tried with equal success in this country, upon a small scale. Using bituminous coal in this way, the entire combustible matter of the coal is converted into gas, consequently, neither tar nor coke is obtained, but an infinitely greater proportion of gas, and that possessing extraordinary powers of illumination. The plan possesses also these advantages, which are of some importance in crowded situations, with an increasing demand for gas-lights,—that the gas may be generated much more rapidly, and requires no purification. This plan will also prove of great value in districts possessing coal containing little or no gas.

It being thus proved that the vapor of water passing through ignited coal converts the whole combustible portion of the coal into inflammable gases, it follows that a well-regulated supply of vapor to a bituminous coal fire would prove an effectual preventive to smoke—smoke being merely the tar and light particles of coal, or lamp black, escaping unburnt from the fire, which would by this application be converted into the gases, carbonic oxide and carburetted hydrogen. A simple and effectual method of applying the vapor, under careful regulation, offers itself by the adoption of a newly-invented fire-grate, consisting of a hollow frame, to be kept filled with water, upon which the grate bars rest, so contrived that a portion of vapor may be kept continually passing through the fire. The

same contrivance preserves the bars from burning, and the coals from clinkering. This invention is, we are given to understand, about to be submitted to the public, and, should it turn out successful in practice, upon a large scale, will prove a great benefit to the metropolis, as, should it be adopted in the large breweries and distilleries, the atmosphere will be relieved of much of the densest of the smoke with which it has been hitherto so much impregnated.—*Mining Journal.*

REPORTS OF SCIENTIFIC MEETINGS.

BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

The meetings of this learned body commenced on the 17th inst. The attendance of Members and Strangers was greater than at any former meeting of the Association, and the city during the interval of the meetings presented quite a gay and animated appearance. The first ordinary meeting was held in the Trades' Hall, on Wednesday afternoon, the Lord Provost in the chair. His Lordship was supported on the right by Sir John Robinson, Colonel O'Reilly, Mr. Scott Russell, Dr. Nicol, Mr. Leadbeater, and others; on the left were Colonel Sykes, Dr. Abercrombie, Mr. Henry Paul, and the Rev. David Fleming.

MEETING OF THE GENERAL COMMITTEE.

A preliminary meeting of the General Committee of the British Association, was held in the Faculty Hall, College Buildings, on Wednesday, at one o'clock—the Marquis of Breadalbane, President of the Association, in the chair.

The Chairman having called upon Professor Phillips, one of the General Secretaries, that gentleman read the minutes of the last meeting of the General Committee held at Birmingham last year.—The minutes were confirmed by a unanimous vote of the meeting.

The report of the council for 1839 was read, the chief points in which related to the grant of £250, in addition to the local expenses at Birmingham, and £300 for the present meeting at Glasgow. Mr. Yates (the secretary to the council), in conclusion, stated that in consequence of the increased and vigorous prosecution of the scientific objects adopted by the association, the call upon the fund had been greater than was calculated, and that, in order to meet the expense, they had sold out £500 Three per Cent. Consols. He also noticed a requisition, signed by five members, relative to the terms of admission; the result of which was that the council had determined to abide by the rules agreed to last year (*i. e.* £2 the first subscription), but to allow lapsed members to return on paying the single pound sterling.

The next portion of the report referred to the publication of the Association's "Transactions;" and it was resolved to publish the annual volume within four months of the close of the meeting, within which time the corrected papers of the contributors should be furnished for the printer. Those that came later to be postponed to the next year's volume. The Birmingham report to be expedited. [It has been published.] The succeeding volumes not to be numbered as in series, and 750 copies to be published: the last we did not hear distinctly.

The next part of the report mentioned a difference of opinion between Professor Owen and Mr. Nasmyth, on papers respecting the structure of the teeth; which had led to a suspension of the publication of Mr. Nasmyth's papers in the "Transactions" of the Association. The whole matter is referred back to the Medical Section at Birmingham.

Professor Daubeny's Report on the Connection between Agriculture and Chemistry is promised for the meeting of 1841, as it could not be got ready for the present.

Some beneficial arrangements were announced in respect to issuing the lists of papers to be read daily in the sections, those withdrawn, and other useful temporary information.

Mr. Phillips noticed Mr. Kingsley's suggestions at the close of the last meeting, which seemed to be indefinitely postponed.

Mr. Murchison, one of the Secretaries, after explaining the plan which had been adopted in the selection of the office-bearers, read the following list:—

Section A.—Mathematics and Physics.

PRESIDENT—Professor Forbes, F.R.S.
VICE-PRESIDENTS—J. B. Airey, Esq., F.R.S., Astr. Royal.
Rev. Professor Whewell, F.R.S.
J. Thomson, LL.D.
SECRETARIES—Professor Sterelty.
Archd. Smith, Esq.

Section B.—Chemistry and Mineralogy.

PRESIDENT—Dr. T. Thomson, F.R.S.
VICE-PRESIDENTS—Professor T. Graham, F.R.S.
Professor Johnston, F.R.S.
SECRETARIES—Dr. Clark.
Professor Playfair.

Section C.—Geology and Physical Geography.

PRESIDENT—Charles Lyell, Esq., F.R.S., G.S.
VICE-PRESIDENTS—Rev. W. Buckland, D.D., P.G.S.
James Smith, Esq., F.R.S.
H. T. De la Beche.
SECRETARIES—David Milne, F.G.S.
H. E. Strickland, Esq.
Professor Scouler.

Section D.—Zoology and Botany.

PRESIDENT—Sir. W. J. Hooker.
VICE-PRESIDENTS—Sir W. Jardine.
Professor Graham, F.R.S.E.
Rev. Dr. Fleming.
R. G. Selby, Esq., F.R.S.
SECRETARIES—Robert Ralton, Esq.
Edward Forbes, Esq.

Section E.—Medical Science.

PRESIDENT—James Watson, Esq., M.D.
VICE-PRESIDENTS—J. Hodgkins, M.D.
Dr. Andrew Buchanan.
Dr. John M'Farlane.
SECRETARIES—Professor Cooper.
Dr. James Brown.
Professor Reid.

Section F.—Statistics.

PRESIDENT—Lord Sandon.
VICE-PRESIDENTS—Sheriff Alison.
Rev. Dr. Chalmers.
SECRETARIES—Professor Ramsey.
Colonel Sykes.
R. Rawson, Esq.
C. F. Baird, Esq.

Section G.—Mechanical Science.

PRESIDENTS—His Grace the Duke of Argyll.
Sir J. Robinson, Secretary, F.R.S.
Rev. G. Robinson, D.D., F.R.S.
VICE-PRESIDENTS—J. Taylor, Esq., F.R.S.
J. Walker, Esq., F.R,S.
SECRETARIES—Charles Vignoles, Esq.
James Thomson, Esq.
James Todd, Esq., S.A., Edinburgh.

Colonel Sykes observed that some names were on more than one commitee; but this having been satisfactorily explained, the list was unanimously agreed to.

A list of the committee of recommendation was next read, to which was added the name of the Marquis of Northampton, who had previously entered the room.

Professor Phillips requested the Office-bearers to remain after the meeting broke up, for the purpose of seeing that the arrangements were completed for the meeting of the several sections on the morrow.

The appointment of the committee of recommendations was next made; and this is the moving wheel of the whole, as the members are elected to represent the various sciences and sections which form the pursuits and the directing powers of the association. For this body were named and approved. A.—Forbes, Airy, Whewell, Wheatstone. B.—J. Thomson, Graham, Johnston. C.—Lyell, Buckland, De la Beche. Geography.—Greenough, D. Jardine, Graham, Fleming. E.—James Watson, Hodgkins, Brown. F.—Lord Sandon, Sykes, Heywood. G.—Robison, Robinson, J. Walker.

The official members also belong to this committee; and the Marquis of Northampton's name was most properly retained upon it.

Some minor details were agreed to, and the treasurer's report was received. It was from Aug. 15, 1839, to Aug. 31, 1840:—"The balance in hand, 460*l.* 13s. 4d. 1,535*l.* 2s., compositions for subscriptions, dividends, &c.; in all, a fund of 3,054*l.* 18s. 1d. The expenditure at Birmingham, 250*l.* Incidents, 103*l.* 11s. 1d. Salaries, 247*l.* 10s. Grants for scientific purposes already paid, 1,548*l.* 4s. 4d. Printing volumes, lists, &c., 521*l.* 19s. 6d. Value of property Sept. 17—balance, 309*l.* 11s. 6d.; in the funds, 4,425*l.*; stock, at a low valuation, 1,160*l.*; total, 5,894*l.* 11s. 6d." There was, therefore, a considerable reduction; but it was accounted for by the deficiency of receipts at Birmingham, and the increased amount of advances for scientific purposes.

It was agreed that the general committee meet on Monday the 22d inst., at half-past two, for the appointment of office-bearers for the next annual meeting, and for fixing the time and place of meeting. On the motion of the Marquis of Northampton, thanks were voted to the Marquis of Breadalbane for his conduct in the chair.

Of the preparations for the Glasgow meeting, to which it may be interesting to refer at a future period, the details are given in the subjoined directions:—

OFFICE-BEARERS, 1840.—President, the Marquis of Breadalbane; Vice-Presidents, the Very Rev. Principal Macfarlane; Major-General Lord Greenock; Sir D. Brewster, Sir T. Brisbane; General Secretaries, R. I. Murchison, Esq., and Major E. Sabine; General Treasurer, J. Taylor, Esq.; Assistant General Secretary, J. Phillips, Esq.; Secretaries for Glasgow, Professor J. P. Nichol, A. Liddell, Esq., J. Strang, Esq.; Treasurer for Glasgow, C. Forbes, Esq.; Secretary to the Council, J. Yates, Esq.

PROGRAMME OF THE PROCEEDINGS OF THE MEETING.—MEETINGS.—The general committee will hold its first meeting on Wednesday, 16th of September, at one o'clock, in the Faculty Hall of Glasgow College, and will meet afterwards according to adjournment.

The sections will assemble for the reading and discussion of reports and other communications on Thursday, 17th September, at 11 a.m.; and afterwards, at the same hour, daily, during the week of the meeting, excepting Wednesday, the 23d, in the Glasgow College.

In case of the subdivision of any of the sections, rooms will be appointed for the purpose.

The sectional committee will meet on Thursday, the 17th, at 10 a.m., and afterwards at the same hour, daily, during the week of the meeting, in rooms adjacent to the section rooms, for the transaction of the business specified in instructions delivered to the secretaries of each section.

The model rooms in Buchanan-street and the Arcade will be open, during the whole week of the meeting, from eight a.m. to ten p.m.

Evening Meetings at Eight p.m.—On Thursday evening, the 17th of September, the first general meeting of the association will be held in the Theatre Royal; when the Marquis of Breadalbane, F.R.S., the president elect, will take the chair, and the address of the general secretaries will be read by R. I. Murchison, Esq., F.R.S.

On Friday and Monday evenings, promenade in the Royal Exchange Rooms, at eight p.m.

The concluding general meeting will take place on Wednesday, the 23d, at three p.m., in the theatre, when the proceedings of the general committee, and the grounds of the several grants of money sanctioned by them, will be explained.

Exhibition of Models, Mechanical Inventions, Products of Industry, &c. &c.

The exhibition of models, illustrating the manufactures of the towns in which the meeting assembles, and of the recent improvements in mechanics, &c., was for several years contemplated by Sir David Brewster, Sir John Robinson, Mr. Babbage and others, and at the Association Meeting in Newcastle this important conception was realised. The example has been followed most successfully in Glasgow. The exhibition which we have now to describe, contains a varied and interesting collection of the produce of the arts and manufactures carried on within the workshops of Glasgow and the principal manufacturing towns of England. The Monteith Rooms in Buchanan-street—the upper consisting of an area of 80 feet by 30 feet, and the lower 70 feet by 30 feet—was laid out with great care by Mr. James Thomson, civil-engineer, secretary to the model committee, whose zeal and assiduity in this department has, from the moment he undertook the duties of the office, been unceasing. On entering the lower room, the visitor's attention is arrested by a beautiful model, by Mr. Kemp, of the Glasgow Cathedral restored. Beyond this is the original steam-engine on which Watt was operating when he made his discovery. This interesting, though somewhat clumsy relict, is overlooked by a beautiful portrait of the immortal genius, the memory of whose work it perpetuates. On the table which runs along the right side of the hall, is a remarkably neat model of a dredging boat, now building for the River Clyde trustees—scale one inch to a foot, deposited by Wm. Bald, Esq., F.R.S.L. and engineer to the trust. Here are also several fine models of bridges—and machines for effecting improvements of various descriptions of work. On the other side may be seen model railways and locomotives, the model of a drain tile work, now erecting on the lands of the Earl of Derby, Lancashire; and a great variety of manufactured articles of ironmongery, and other sorts, including a very elegant grate, constructed on a new principle, and beautifully ornamented with bronzed and marble mouldings, &c. The walls were hung with various plans and drawings, with a section of the tides and harbour of Glasgow, taken from the 1st of October, 1839, to the 1st of September, 1840, by Mr. Bald, by whom also are deposited two charts of the harbour, showing the wet dock and improvements to be made under the new River Bill. Opposite the entrance of the upper room, there is a large tank of water with a water filter at one end and a water meter at the other, and a rain gauge constructed at the further side. Here are exhibited several models of vessels—the Archimedes with an alleged improved screw-propeller. On either side of the entrance is a galvanic telegraph, the one by Mr. Alexander, of Edinburgh, having a galvanometer and a wire for every letter or signal that is to be transmitted, with one wire more for completing the connexion in the returning direction; the other is Mr. Pontin's invention exhibited by Mr. Dunn, Glasgow.

The peculiarity of this instrument consists in its requiring only three wires to be stretched between the two stations, by means of which forty-two signals are transmitted, and an alarm given, the method of producing which is also believed to be peculiar. This may be thus explained. The galvanometor by which the alarm is given, is distinct from those by which the other signals are produced, and is placed in the circuit of one of the wires. It consists of two coils of copper ribbon attached together and placed parallel to each other, with a space betwen them. Two needles are suspended within the coils, having a platinum wire terminating in a small apiral coil across the direction of the needle. Under the end of the platinum wire is placed a spirit lamp, with a small flame, by means of which the platinum coil is maintained at a white heat. When the needle deviates by means of the galvanic influence transmitted from the other end of the telegraph, it carries round with it the hot platinum coil, which meets a fine cotton thread stretched in its course. This thread is attached to a cord, by which a pendulum is drawn aside from a bell or gong, upon which it tends to fall. The moment that the hot wire touches the thread, it burns it, and the pendulum, being freed, strikes the bell or gong, and thus the attention of the person at the telegraph is called to the signal that is made. To prevent mistakes, the signals are returned at such intervals as may be agreed on, either letter by letter, or word by word, the same wires being used to return as to transmit the signal. The wires are brought into connection with the plate of the battery, by dipping the connecting wires attached to the keys into mercury; the galvanic action thus only affects the different needles during the time that any key is kept down. The further improvement of this instrument, and a more familiar acquaintance with its use, may ultimately lead to connections being made between the most distant countries in the world for the transmission of intelligence; and posterity may perhaps witness the receipt of news from India by means of a galvanic telegraph in as many minutes as there are months now occupied in the conveyance of a despatch. Beautiful models of the Royal George and the Victoria, the latter constructed by a sailor, are exhibited, and there is in one of the rooms the engine of the Comet steamer, the first successful applicatiou of the steam engine to navigation, by the late Henry Bell. The Comet steamer latterly plied on the West Highland station, and was wrecked in the Doors of Dorrismore. The late Messrs. Girdwood and Co. were at the trouble of having the engine recovered from the wreck, and put up in their works, as a valuable curiosity, at the expense of L. 120. There are busts of the late Mr. Chas. Tennent of St. Rollox. and Mr. Lowe of Liverpool, in marble, by Mr. Park of London. and a beautifully wrought bust, also in marble, of Mr. James Lumsden, cut by Mr. Mossman, jun. In the orchestra is exhibited, from time to time, the Bude light, with the effect of which our readers are already acquainted. A number of the articles formerly in the Exhibition in the Arcade, have been transferred to these apartments, and the tables present a splendid array of highly-finished and ingenious contrivances, among which we may mention the following:—A Tyrolese Matchlock Rifle, made in 1663, deposited by Mr. Willis, Exchange Square.—A Machine for Registering of Work done by Letter-press Printers, &c., deposited by Peter Buchan, 14, Renfrew Street.—A Patent Net Loom, in operation, from Messrs. T. and J. Robertson, Paisley.—A Model of an Hydraulic Engine, for raising water by means of centrifugal motion, from Mr. Wm. Kemp, Galashiels, by whom are deposited also a Model of a Machine for cutting out circular pieces of wood, of various dimensions, for which invention a reward of L. 15 was given by the Board of Trustees for the encouragement of Arts in Scotland; a Drawing and description of a Method of Heating Gas Retorts, by injecting coal tar (the produce, or rather refuse, of gas works) to the furnace, by means of a force pump. By this method, it is said, one cwt. of coal tar is of equal value with two cwt. of the best Scotch coals. A correct model of Eldon Hills, showing their very singular volcanic formation, and the water-worn terraces on their sides. The next object which attracts the attention of the visitor is the Alpaca—an animal of the Llama tribe, native of the Cordilleras, or mountain district of Peru, valuable for its wool, importations of which have taken place amounting to 3,000,000 lbs. It is used as deer in the parks of the Spanish Grandees in Peru, and its flesh is equal to any venison. Some are white, others brown and mottled. (Patterns of manufacture from the wool, as fine as silk, are exhibited on the table No. 3, Upper Room.) The Alpaca does not perspire as sheep do, and therefore requires no smearing, which will be an immense saving to the Scotch farmer; and the heavy coat of wool on its body, (fine as silk,) is sufficient protection in the Peruvian mountains, where deluges of rain fall four months in the summer season; and from the Alpaca living under the line of perpetual snow, it proves that a cold climate is congenial to them even in winter. The Alpaca lives on "zeho," a kind of withered grass which grows on all mountains above a certain altitude—proving that they will exist where sheep will not. Specimens of different kinds of manufacture from Alpaca, in imitation of silk, are exhibited,—some black as jet (without dye), others white, colored, dyed, and woven in great variety of figures; can be manufactured at one-third the price of silk, and three times more valuable than Scotch wool. The Alpaca is especially adapted for Scotland, as recommended at the 9th meeting of the British Association. From Wm. Dunson, Esq., Liverpool, samples of the raw Alpaca silky wool, assorted black, (without dye,) white, red, brown, foxy, grey, mottled, &c., are also to be seen. There is no animal grease in this wool—illustrative that the animal requires no washing before sheering. This Alpaca wool can at present be sold at 20d., per lb. During the panic of 1837, when Highland wool sold at 3½ per lb., upwards of 1,000,000 lbs., of Alpaca realised 2s. and 2s. 6d. per lb.

There are also exhibited in this room numerous specimens of new and improved manufactures, in various branches. At the further end of the room is a Paisley Shawl Loom, with drawings, in full operation, fitted up by Messrs. John Roxburgh and Sons, Paisley, and Mr. Kemp, Buchanan Street, Glasgow. One side of the room is principally occupied with a collection of tartans, the finest that have been produced in Scotland, from the emporium of Mr. Kemp. From each pattern being labelled with the name of the clan, they form an object of great interest.

The windows present several beautiful specimens of stained and enamelled glass, such as a map of the Clyde, a chart of the Atlantic ocean, a portrait of Lord Brougham in his robes, and of Queen Victoria. There are on the tables also numerous specimens of oval turning. The process of manufacturing German silver goods is illustrated by several specimens. Various steam-engine models are exhibited; among these is a model of a condensing steam-engine, which obtained the prize at the Andersonian University for 1840, constructed under peculiar disadvantages by a young self-taught amateur mechanic. The steam-gun, and a variety of articles, have been retained in the Arcade Exhibition, which is also open for members of the Association, and where is to be seen an excellent collection of paintings, deposited by Mr. Haldane. There are a great many articles, a description of which would occupy a greater space than we can devote to it; but we cannot close our notice of the exhibition of models, as a whole, without expressing our admiration of the varied, rich, and extensive display which the Committee have been enabled to get up.

Thursday, Sept. 17.—Section A.—Mathematics and Physics.

Professor Forbes, F.R.S., in the Chair.

The following were the papers announced for the first day.

1. Sir J. F. W. Herschell. Report on Magnetism.

2. Major Sabine's Report on Translation of Foreign Memoirs.

3. Professor Powell. Report on Radiant Heat.

4. Professor Forbes. Supplementary Report on Meteorology.

5. Professor Whewell's Report on Tide Discussions.

6. Professor Powell on a Limit to the Refrangibility of Heat and Light.

7. Mr. Graham on the Solution of Numerical Equations.

Professor Forbes, the president of the sections after stating that it was usual to give precedence to the reports drawn up at the request of the British Association, and for which money in some cases had been granted, called upon Major Sabine in the absence of Sir J. Herschell, for the Report on Magnetism.

Major Sabine stated, that it had not yet been re-

ceived, but he expected it to-morrow. And he proceeded with his own, No. 2, above. For the translation of Foreign Scientific Memoirs, £100 had been voted at the Newcastle meeting in 1838, and a similar sum last year. By some omission, no report was made at Birmingham of the uses to which the first grant was applied, therefore, the present one embraced a period of two years. The committee had availed themselves of Taylor's Scientific Memoirs as the medium of publication. But as the reading scientific public have doubtless already reaped considerable advantage by the perusal of these welcome translations, I need not enumerate their titles, but only remark that seven of the series had been gratuitously forwarded to the committee, and by them given to Mr. Taylor for publication.

The next paper was one by Professor Powell, which, in his absence, was read by Professor Whewell—On Latent Heat and the Refrangibility of Heat and Light.—Professor W. stated, that the report was extremely voluminous, and he would, therefore, only read such portions of it as were likely to be most interesting. It was intended as a supplement to a former report on the same subject, and contained notices of the discoveries which had since been made in this branch of Science, which had in a great measure altered the views previously entertained on the subject. The subject had now divided itself into two branches, unpolarised and polarised heat. On these points, the report detailed at great length the results of the various researches of Mr. Mellonie and of Professor Forbes. Among other points which these researches had decided, was the fact, that the resistance to the transmission of heat was not in the surface, but in the body of the mass; that rock salt transmitted heat more freely than most other substances, so that 92 rays of heat passed through it, whether the heat arose from flame, hot iron, or water at 212 deg. The report alluded to the series of experiments on the transmission and refraction of heat, published by Professor Forbes in 1835. Among other experiments, he tried whether heat could be protected in the moon's rays, but he found no indication of its existence. If there did exist any, it must be less than the 300,000th part of a degree in the centigrade thermometer as tried by the thermo-multiplier. Professor Whewell stated, that he would pass over a considerable portion of the report which treated of the influence of color in the transmission of heat, and on the subject of the formation of ice under water; and would give a few extracts relative to the experiments on the polarisation of heat. Mr. Mellonie had tried experiments with tourmaline, but without effect. In 1834, however, Professor Forbes took up the subject, and succeeded in polarising the heat by means of plates of mica; and this formed the great point of the discovery. The next discovery was that of the Circular and Eliptical Polarisation of Heat, an account of which, Professor Forbes had published in the Edinburgh Journal of Science, in March, 1836. Among other points discovered, it was found that the quantity of rays transmitted was in proportion to the light used—thus with an argand, 74 out of 100 were transmitted, while with water there was only 44. Another important point was, that the red wave of heat by the mica plates was three times the length of the wave of red light. The report concluded, by reviewing the progress of the discoveries, and allotting to the respective parties concerned in the discovery that share which appeared due to them for their elucidation of the subject.

Professor Forbes took this opportunity to mention, that the difference of opinion between himself and Mellonie, with regard to unequal polarisation of heat from different sources, would soon be settled. Mellonie had recently published what will bear an interpretation to reconcile the differences.

Professor Stevelly asked how, consistently with the wave theory, can heat be considered the quantitive substance which chemistry shows it to be?

Professor Forbes had never entertained this view; he had not given an opinion on the nature of heat, but merely on radiation, and he called upon Professor Cleland to speak to this point. The latter briefly observed that he had attempted to reconcile this. He had conceived that the molecules of the element of heat must be transmitted, and accumulate in transmission. He gave also a formula which I need not here record. He has written fully on the subject.

Professor Whewell suggested to Professor Stevelly, that when it is said we have quantitive heat, the term is extremely indefinite. He would ask what is temperature? What quantities do temperatures mark? They were no indications of substance. Quantity of light accumulated is shown by the photometer, as of heat by the thermometer, and he thought now, that the attempt to combine calorie with the elements must be dropped. He then observed that he was not at all biassed in the material theory of heat; but there was one point, one circumstance, to which he objected—the great length of the wave as compared with that of light, and the small difference in the refracting index.

Professor Forbes stated, that the explanation of this was not his, but as it was set down for to-day, he would proceed to read Professor Powell's explanation of the phenomena of dispersion. This is number 6 in the above list. These phenomena were long considered as an objection to the undulatory theory of light, but now removed by a limit to refrangibility having been obtained, the length of the wave being indefinitely great in regard to the distance of the molecules of the ether from each other. Rays of heat from ordinary sources, consist of waves of much greater length than those of light, but are not appreciated by the human eye. If the heat wave were three times as long as the wave of light, would not the refrangibility be proportionably diminished? Yes, if there were no limit to refrangibility. But the length of the wave of heat is in certain ratio to the distance of the particles, and the refrangibility of the ray is nearly that of light, although the wave is much longer.

Sir David Brewster suggested experiments on the effect of the opalescence of bodies on heat. He would like it to be ascertained also, what kind of heat would be reflected from the green solutions of plants, for instance, from an alcoholic solution of laurels? Sir D. Brewster's remarks were most interesting.

Professor Forbes said, for himself, he had thought the experiments suggested of great importance; he had tried various substances similar in structure and in strict analogy to opalescence, and had found that the rays of heat reflected in these cases were most refrangible.

The next report was one read by Professor Forbes on Meteorology, supplementary to a report read by him eight years ago. The report, he said, was so long, that he could only direct attention to one or two extracts. He had treated the subject under the different heads of Temperature in connection with the Barometer; Pressure in connection with the Barometer, and Meteorological observations generally; Atmospheric heat: the Temperature of the Sphere beyond the atmosphere; Solar radiation; Temperature of the Globe itself; Humidity; Winds; Storms; Electricity; the November Meteors; and concluded by a few suggestions on the subject of national and local observatories. The principal point on which he read extracts from his report, was that of the Temperature of the Globe. He held that internal heat had little or no influence on the external crust of the earth, and that the portion of the sun's rays which reached through the atmosphere, had but very little effect below the surface of the earth, except for a limited distance. The heat of the atmosphere decreased geometrically upwards, as the heat of the Globe increased arithmetically downwards. The heat sent down from the surface depended on the nature of the soil and its conducting power; and, except by thermometers placed at different depths, they could not arrive at a proper conclusion on the subject. The amount of solar heat lost, by coming through the atmosphere, he estimated at 25 per cent. on a vertical ray. The value of the specific heat of the soil was estimated at 56! but as to the same subject in this country, he would, during the meeting, give some results of experiments tried at Edinburgh. Within the tropics, the mean heat was found by putting the thermometer one foot below ground in the shade. Prouisson estimates the sun's influence at Paris at 24 degrees centigrade; the mean temperature at Paris was 11 degrees centigrado, leaving thus—13 degrees centigrade, or 9 degrees of Fahrenheit, as the temperature of the globe, were the sun entirely withdrawn, a temperature greater than that of the polar regions. He then alluded to the erroneous calculations of Barometrical measurements, and instanced the case of the Caspian Sea, which Barometrically was 330 feet lower than the Meditorranean, while, by actual levelling, it was only 80 feet. On the subject of Humidity, he had given in his report some experiments on the dew point, and had suggested a new Theory of Winds; but he would not detain the Section by entering into these matters. He stated that, on the August and November meteors, the report gave an abstract of the papers which had appeared upon that subject. He concluded by reading some suggestions on the necessity of National Observatories, and the proper mode of managing them.

Professor Whewell next read a report on the subject of the tides. The object was to ascertain the moon's mean declination; but as it varied every year, a number of years' observations would be required. From a series of observations made at Leith, a number of calculations had been made; and from observations also made at Liverpool, Bristol, and Portsmouth, tables had been made to show the height of the tide at any hour of the day at the moon's age. Observations had also been made to determine the curve of the rise and fall of the tides, of which calculations had also been made. Diagrams of the curves were exhibited and explained to the Section.

Professor Thomson stated the purport of a paper given in by Mr. Graham on the subject of a new solution of Numerical Equations. The Professor stated that the principle was correct, but that he considered the principle of Mr. Horner to be superior.

The Section then adjourned.

Section B.—Chemistry and Mineralogy. Dr. T. Thomson, F.R.S., in the Chair.

The papers announced were:—

1. Mr. Schoenbien, Report on Electricity.
2. Mr. Solly, on Bleaching Vegetable Wax.
3. Dr. Gregory, on the pre-existence of urea in uric acid.
4. Dr. Gregory on Liebeg's process for preparing mur-oxide.
5. Dr. Schafheutl, on the relation of forms to chemical compounds.

The first paper read was, "On the peculiar color evolved in certain electro-chemical decompositions," by Professor Schonbein. In the absence of the author, Mr. E. Solly read the paper to the section.

The second paper was read by Mr. E. Solly, "On the best method of bleaching vegetable wax."

Professor Gregory read a communication, "On the pre-existence of urea in uric." Professor Gregory then exhibited a new process, communicated by Professor Liebeg, for preparing the new, singular, and beautiful compound, termed muroxide by Liebeg and Wöhler, and purpurate of ammonia by Prout.

The last paper was read by Dr. Schafheutl, "On a new compound of arsenious acid and sulphuric acid," which appears to be the destructive agent to vegetable and animal life, in the vapor emitted from the copper-works at Swansea, in South Wales. The view elicited by this interesting discovery of Dr. Schafheutl is likely to throw much light on some peculiarities observed in poisoning by arsenic.

Section C.—Geology. Mr. Lyell in the Chair.

1. Dr. James Robb, on the Geological Features of the river St. John, in New Brunswick.

2. Mr. Stevenson, on Changes of Level Land and Sea.

3. Capt. Baddoley, on the Geology of Canada.

4. Mr. Bowman, on the Silurian Rocks of Llangollen.

Dr. Robb proceeded to give an account of the St. John, an important river, which drained two-thirds of the province. Up country, it is ten miles wide, but where it discharges itself into the Bay of Fundy its width is only 310 feet. There the tide caused a fall up the river of 25 feet, and presented an enormous cascade. All along the banks were terraces of different deposits, as if the river originally had filled the whole valley.

Mr. Lyell called that flow and fall of the tide the bore, which occurs in several estuaries; and he inquired whether organic remains had been found in the deposits described?

Dr. Robb replied very few; some unios and fresh water shells, and that there appeared evidence of a recent and gradual upheaving of the land. In answer to another question, he observed that the slopes of the country were from the river, but that this may be accounted for by the sedges and grasses, growing on the sides, collecting, and thus accumulating, the sand and gravel.

Mr. Greenough made some observations on the term elevation of lands. He thought the old term subsidence was preferable.

Dr. Robb again, in answer, said that some bones had been found, but although they had been called those of the mammoth, he thought them the jaw of the spermaceti whale.

Mr. Stevenson's paper merely alluded to general principles, the details of which were described as proportionate to a universal waste of sea coast.

In reference to this, Mr. Smith described the valley of the Clyde. There are three distinct beds: the first below the tertiary consisted of Lyell's diluvium, in which erratic blocks are found; it is known also as the till formation; the second, the tertiary beds of clay, of which tiles and bricks were made, and in which marine remains were found; third, the upper, called the historical series, because boats, &c., evidences of man, are found therein, and on this the lower part of Glasgow is built. This upper bed is traversed by a dyke of igneous origin, and exhibits a fall of forty feet, which induced him to believe in a general and great subsidera, from the small point of time the present structure exhibited. The brick-clay formation, he considered to have been deposited at the bottom of the sea, although the same things exist in the valleys of the Forth and Tay. The diluvium contains organic remains of deer, and other species not ascertained. In some parts, under the diluvium, there are stratified beds, but very rare. It is a most remarkable circumstance, that all the sea shells found in the till are identical with those found in the arctic regions, and seem to prove the period of a colder climate.

The President gave his opinion, that this remarkable fact showed a great change from cold to warm, and perhaps it was connected with that change in which the erratic blocks were distributed.

Mr. Greenough expressed surprise at a remark in Mr. Stevenson's paper, that little had been done to ascertain the mean level of the sea, and he referred to the several reports by Professor Whewell.

This is a strong and sorrowful proof of how little known is the annual publication of the transactions of the Association.

Mr. De la Beche mentioned that, among other extraordinary things from surveys of the coast of Wales, Devonshire, Cornwall, &c., the mean height was forty feet, and a falling away of that space which was supposed to be the diminution over a large area.

Mr. Milne stated that, on the east coast of Scotland, he had ascertained that there was a cliff exactly 40 feet above the level of high-water mark. At Stirling, also, the cliff was 40 feet high. At Dunbar, lower down, only 13 feet. Further inland, the cliff was still higher, 90 or 100 feet, which seemed to show an earlier subsidence; he had traced three miles; it indicated sea; it was of the period of the conglomerate, skirting the Ochill range.

Dr. Buckland noticed the importance of the identity of the shells of the till to the aretic shells.

The remaining papers were then read.

Section D.—Natural History. Rev. Dr. Fleming in the Chair.

The announcements were—

1. Professor Henslow. Report on the Preservation of Animal and Vegetable Substances.

2. Mr. E. Forbes and Mr. Goodsir on the Structure of the Ciliograda.

3. Dr. Hodgkin. Queries Respecting the Human race.

4. Dr. E. Lankester. Notice of Plants and Animals occurring in the Sulphurous Waters of Yorkshire.

5. Dr. Wm. Mac'Donald, on the Structure of Fishes.

The first paper read was Professor Henslow's Report on the Preservation of Animal and Vegetable Substances. The report was read by Mr. Babington, in the unavoidable absence of the Professor. Professor Henslow divided his report into two parts; in the first, he stated the results obtained with vegetables. The effects of a number of preservatives, chiefly mineral, were experimentally investigated; but with vegetables the success obtained was very slight, none of the salts being likely to turn out favorably. In naphtha and acetic acid, the specimens were preserved, but in the latter they lose their color, and assume a reddish tinge.

Mr. Forbes and Mr. Goodsir on the Structure of the Ciliograda.

In this paper, the authors gave an account of the researches they had made on this subject since the last meeting, chiefly bearing on their internal structure. They stated that they had confirmed Mr. Garner's discovery of the existence of cilia in the stomach and vessels. The mouth was found to be surrounded by a rim of cilia. The authors announced their discovery that ciliary motion depends, in these animals, on the presence of a granular tissue having undulating movements on which the cilia are placed. They stated that the description hitherto given of these animals as characterised by having two openings to the digestive canal is not true, and that there is but one opening as in other medusea. Lastly, they gave an account of a remarkable worm which lives in the stomach and vessels of the Cydippa, and which presents the first instance of an Entozoon, or intestinal worm, inhabiting the interior of any of the Acalepha, or jelly fishes.

Queries respecting the Human Race.

Mr. Patterson, in the unavoidable absence of Dr. Hodgkin, brought forward a paper containing a series of queries respecting the human race, to be addressed to travellers and others, and which had been printed at the suggestion of the Natural Historical Section. The object of the queries was to supply a desideratum complained of by Dr. Pritchard, at the last meeting of the British Association, at Birmingham, in a paper which he read, "On the extinction of some varieties of the human race," wherein he pointed out the irretrievable loss which science had sustained by a large portion of the human race, counting by tribes instead of individuals, having been suffered to perish before many interesting questions of a psychological, physiological, and philosophical character, as well as many historical facts in relation to them, had been investigated. To supply this deficiency, a series of queries had been prepared by the Committee, and were read in detail by Mr. Patterson. The report states, that Britain, in her extensive colonial possessions and commerce, possesses unrivalled facilities for the elucidation of the whole subject. The queries, which are too numerous and extensive for publication in our present number, refer generally to the stature of the people—the disproportion between the different parts of the body—the complexion—the color and character of the hair and eyes—the formation of the head and face—the skull—and other physical peculiarities; the effect of intermarriage where it prevails—the character of the language—ceremonies—superstition—mode of education—marriage—polygamy, divorce—dress of natives—long or short lived—treatment of sick—nature of sickness—inferior animals associated with man—method of disposing of the dead, and ceremonies connected with burying—notions of a future state—habitations of the people—monuments—remains of skeletons—tools and instruments of art—form of government—food of the people—modo of cooking—clans or castes—laws—geographical limits—population—religious observances—magic, witchcraft, or second sight. These, and other particulars, the traveller is recommended to ascertain, by personal intercourse with the people, and it would be desirable that he should form some idea of the amount of the intelligence, the tone of mind with regard to social relation, as respect, freedom, independence, and their recognition of moral obligations, and any other psychological character which observation may detect, and more especially such as may contribute to an estimation of the probable results, by efforts to develope and improve the character.

After some conversation between Mr. Brodie and Dr. Macdonald, in reference to the theory that the accentuation of most languages was preserved, even when the words were changed, Dr. Fleming said that the subject suggested some important considerations, which he trusted would be brought before the Association on a future occasion.

Plants and Animals found in the Sulphurous Waters of Yorkshire.

Dr. Edwin Lankester gave a notice of plants and animals found in the sulphurous waters of Yorkshire. The inorganic ingredients of mineral waters have been closely investigated, but so much attention has not been given to the organic matters they frequently contain. Continental chemists have described various organic substances under the names of *Glairine, Baregine, Zoogene*, animal and vegeto-animal matters, &c. In the sulphurous waters of Harrogate and Askern, a plant described by Dillwyn as *Conferva nivea*, is frequently found, and the author has recognised, in the organic filaments described by Dallberry and others, the early state of growth of the *Conferva nivea*. In Harrogate a *Conferva* abounds, having a peculiar structure similar to that of *Oscillatoria*. These *Conferva* quickly decompose, giving rise to a variety of singular secondary compounds, which have led to the supposed existence of the various substances before alluded to. Vegetable matters existing in these situations have been before recorded, but no distinct notice of animalculæ occurs. The author described two new animalcules which he had discovered, forming a beautiful rose-colored deposit, in the sulphur wells of Harrogate and Askern. So constantly do these animalcules occur in the sulphurous waters, or districts where sulphuretted hydrogen exists, that the latter may be always inferred from the presence of the former. The animalculæ appear to be at present undescribed, but one of them resembles the *Astasia hamatodes* of Ehrenberg, which he found producing a rose-colored deposit in Siberia. Specimen drawings of the animalcules and plants were exhibited to the Section.

On the Structure of Fishes.—By Dr. Macdonald, F.R.S.E., &c.

After pointing out the advantage derived of late years by tracing the analogies of the different numbers of the Zoological scale, and the adoption of the circular arrangements of Systematic Zoology, he proceeded rapidly to show that, in the particular class of fishes, very erroneous views had been promulgated under the authority of names the most distinguished in science, and more particularly by

the illustrious Cuvier. Restricting his observations to the skeletons of fishes, and principally to the analogies of the different similes of higher vertebrals, he showed that the pectoral fin had been mistaken for the anterior or respiratory limb, and that more correct induction and observation would easily show, that there was a much stronger analogy between it and the pelvis arch and posterior extremity. According to Cuvier, (whose opinion he respectfully dreaded to dissent from), the pectoral fin was supported, 1, by a clavicle composed of two pieces, with a coracoid process, frequently also found double. A single bone represented the humerus, the radius and ulna, and carpus and phalanges; also, two hones, four smaller specula, to which were attached the rays of the fins. Viewing this fin as the analogies of the leg, or posterior extremity, the upper portion of the scapula represents the pelvis bone or *os innominatum* cannected with the femur by means of a beautiful acetabular joint. The tibia is the largest hone of the circle; its very largely developed internal malleolus meeting with that of the opposite side under the head, forms a complete circle. The hene, mistaken for the coracoid process of the scapula, is truly the tibula; (the leg being turned has thrown it internal), and the foot with its sole anterior. The tursus is then traceable with the usual character of the higher vertebrals, where it is always very easy to trace a strong analogy, both in form and function, with the fore arm and carpus, and it is this which has tended to mislead naturalists. He then pointed out that the opercular hones were the analogies of the anterior extremity, and that in the Osseous fishes the bronchial respiration was always connected with this form; and that in the Proteus, where both pulmonic and bronchial circulation existed, both the specular circle and the scapular clavicular arch and arm existed; and that in the Cartilaginous fishes, where the respiration was different from both, the scapular clavicle and anterior extremity were largely developed, with the pelvis and leg, also found in connection with the lower part of the spine. Thus, in this class of fishes, it is easy to prove that the Pectoral Fin of Ichtbyologists is really the leg, and that the opercular bones represent scapula, clavicular arch and arm, or respiratory limb.

Section E.—Medical.

1. Report on the Motions and Sounds of the Heart, by the London Committee of the British Association for 1839—40.

2. Dr. Jeffray's Paper on the Uses of the Conglobate Glands.

3. Dr. Perry's Paper on the Diffusion of Contagion.

Section F.—Statistics.

1. Captain Miller on the State of Crime within the Royalty of Glasgow.

2. Dr. Cleland. A General View of the Population, Trade, and Commerce of Glasgow.

3. Mr. Alston. On the Progress of the Blind Asylum in Glasgow.

Section G.—Mechanics.—Sir John Robison in the Chair.

1. Mr. Galline on Safety Valves.

2 Mr. Wallace on Extinguishing Fire in Steam Vessels.

3. Mr. Grime on Wheels of Locomotive Engines.

4. Mr. J. Scott Russell on the Temperature of most effective Condensation in Steam Vessels.

5. Mr. Richie on the Warming and Ventilation of Buildings.

6. Mr. Vignoles on large Timber Bridges, with special reference to Railways.

7. Mr. Fairbairn on the Structure of Iron Steam Vessels.

8. Mr. Eaton Hodgkinson on the Strength of Iron.

The authors of the two latter were unprepared, and the papers consequently stand over.

Mr. J. Scott Russell said, the first paper was that of Mr. Galline "On Safety Valves." He did not intend to follow Mr. Galline through the whole of his description, but would read that part which tended to illustrate his plan. Mr. Galline went on the general principle that the safety valves at present in use were not large enough, and his object was to allow a large surface, like the lid of a chest, to rise at once when the pressure below becomes great enough to force it up, so that upon a great accumulation of steam it will escape before any accident could take place. He meant, in fact, that a large valve should open instead of a small one. As Mr. Galline had not submitted machinery for it, and the subject could not be adequately explained without a diagram, the section would be content by its attention being called to a matter so important. There were no remarks made, and the paper was lodged.

Mr. Russell then took up the next paper, that of Mr. Wallace "On extinguishing fire in steam-vessels."

A paper was then read from Mr. Ritchie on the warming and ventilation of buildings, supplementary to the document on the same subject in *Loudon's Encyclopædia.*

(To be Continued.)

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Mining Journal Office, 37, New Broad-street, City, 27th June, 1840.

NEW WORK ON THE IRON TRADE.—The Number of the MINING REVIEW this day published, contains the Sixth Part of the Paper on the IRON TRADE, by Harry Scrivenor, Esq.—this work will be completed in Twelve Monthly Parts, and so arranged as to form a separate volume at the end of the year; in addition to which the MINING REVIEW contains—A Paper on the Establishment of a School of Mines—On the Ventilation of Mines, by Samuel Moyle, Esq., C.E.—On the Preparation of China-Clay, by W. J. Henwood, Esq., F.R.S., &c.—On Blasting Limestone Rock, being an Account of Blasting the White Limestone in the Country of Antrim, Ireland, by William Bald, F.R.S.E., M.R.I.A.—On the Applicability of Peat to Manufacturing Iron—Parliamentary Returns of the Imports and Exports of Copper, Lead, and Tin, for the year ending 5th January, 1840—Scientific Bodies, &c.—The MINING REVIEW is published at the office, as above, on the 1st of each month, price Sixpence.

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THE

INVENTORS' ADVOCATE,

AND JOURNAL OF INDUSTRY;

A WEEKLY BRITISH AND FOREIGN MISCELLANY OF

INVENTIONS, TRADE, MANUFACTURES, LITERATURE, AND THE ARTS.

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No. 62.] SATURDAY, OCTOBER 3, 1840. [PRICE FIVEPENCE STAMPED. CIRCULATING FREE BY POST.

THE DEVELOPMENT OF PLANTS.

At a recent sitting of the French Academy of Sciences, M. Payen described the results of his late researches respecting the development of plants. According to the theory of M. Payen, resulting from former experiments, the substance which forms the elementary membranes of the tissue of all plants is the same in every species of vegetables. It contains only three elements combined, and in these proportions, viz., of carbon 45, and of hydrogen and oxygen in the proportion in which they exist in water, 55. M. Payen calls this primary substance of vegetables *cellulose*. If this composition changes ultimately, the change is owing to the fresh coats of cellulose, deposited by the progress of vegetation, being incrusted with many other organic substances; such, for example, as those to which wood owes its hardness.

Cellulose is composed of the same elements as starch; we can thus easily conceive how the latter substance, which is contained in the grains of corn, maize, barley, and in an infinity of vegetable products, may contribute to the ulterior development of vegetation, by assimilating to the cellulose, to form other parts of the new fibres.

The fundamental distinction which M. Payen established between animal and vegetable tissue is, that all the membranes of the former are composed of four elements instead of three; viz., of carbon, hydrogen, oxygen, and azote. They have also distinctive properties; the animal tissue is colored yellow by iodine; it yields an ammoniacal product by distillation, and produces a peculiar reaction with tannin, the bichloride of mercury, and with many other reagents, which form no similar combination with cellulose.

It was important to establish this distinction. At first the observations on this point appeared to assimilate the elements of these two great divisions of organised life; M. Payen having himself shown that all the organs of very young plants, without any exception, enclose in their cellular membranes extraneous substances, containing azote in abundance, so as to cause it to present the character of animal matter. It became necessary, therefore, to explain this apparent confusion. It now appears, however, by his more recent experiments, that the two general laws respecting the analogy and the difference between animals and vegetables are well established.

The new researches of M. Payen relate to the mineral substances extracted from the soil by the plants, to the products of their transformations, and to the places these substances occupy in the vegetable tissue.

Thus lime, which Fourcroy and Vauquelin believed could never exist in the state of carbonate in plants, was detected by M. Payen in this state in almost all leaves. The substances recently examined by M. Mayen in fig trees comes within the class of general calcareous secretions noticed by M. Payen. He has found them in a great number of plants, and he demonstrates that so far from being, as M. Meyen believed, small extraneous gummy matters, they are real pedicle organs composed of cellulose, and intended to secrete the carbonate of lime in a tissue so fine that it escaped the observation of the German philosopher.

M. Payen has also discovered the presence, in most cases, of oxalate of lime in irregular crystals, diaphonous, agglomerated in small spheroids, bristling with points, in the midst of the green tissue and larger cells of the edgings of leaves; the membranes themselves of the tissue of leaves are incrusted with silica, diffused over their surfaces in such a manner that the skeletons of the leaves may be preserved after burning, if the operation be carefully performed.

These new facts will be the means, it is said, of establishing on a solid basis the theory for the improvement of soils, by enabling cultivators to ascertain beforehand the nature of those portions of the soil which adhere in the greatest proportion to the different plants cultivated on the same land. They may also serve to explain the practical fact, long since announced by M. Payen, that all gases or vapors which are more acid than carbonic acid gas, are very injurious to the leaves of plants, whilst the carbonate of ammonia in the air is extremely favorable to their growth.

THE HEMP AND FLAX OF THE EAST INDIES.

A communication respecting the hemps and flaxes of the East Indies has been received; according to which no country in the world perhaps produces a larger variety of flaxes than India, and in no country has the cultivation of them been less attended to. This circumstance is only accounted for by the "khiar" or fibres of the cocoa nut husk being generally used by the natives for domestic and nautical purposes. Mr. James Kyd, a shipwright of Kiddipore, directed his attention, however, to the different hemps and flaxes indigenous to the country, and he maintained that the "Sun," if properly cured and dressed, would prove equal to the best samples of the Russian hemp, and even as it was then produced it was little inferior to it. A small quantity of the same, when converted into cables, was forwarded to Mr. Kyd's dockyard for trial. It was found to answer well. "Jute," another kind, seems to be used very generally by the natives, and is therefore cultivated on an extensive scale. It forms the great staple for domestic purposes. The next hemp noticed was the "khiar," manufactured from the fibres of the husk of the cocoa nut. The best khiar comes from Penang and the islands contiguous to it, the fibres of the nuts grown in these districts being much longer than those produced by the nuts of Bengal. This is principally used for maritime purposes, and with it almost all the native vessels are rigged. It is said to possess one singular advantage over other descriptions, which is, that its specific gravity is lighter than that of seawater. Mr. Kyd also has spoken of a remarkably strong, black, fibrous substance, much resembling coarse horsehair, which the Malays twisted into ropes and cables, and which they called "Ejoo," a material very little known to Europeans. It grew in large tufts out of the corticeous apertures of the "Sejee," a species of palm which is to be met with in all the islands bordering upon the Straits of Malacca. They made use of these ropes for rigging. Mr. Kyd possessed one of these cables, and found one which he had had four years exposed to all weathers, raised the bow-anchor of a merchant ship of 560 tons, buried in the sands of the Hoogly, in two previous attempts at which three Russian hempen cables had given way. The Manilla hemp is used for running rigging, and makes exceedingly good tiller ropes. It is the production of the wild plantain, the Musa Sylvestris, and is a native of the Philippine Islands. It runs very long in the fibre, and is capable of being converted into good cloths. The people of the Celebes turn it to this account. The Yucca Angustifolia, a wild species of aloe, abounds throughout Bengal. The fibres of the leaves average three feet in length, and are exceedingly fine and strong, each fibre being capable of sustaining one pound avoirdupois in weight. The ropes formed of this material have been found to surpass in strength those constructed of Russian hemp. The Aloe Spicata thrives prodigiously well in all the southern provinces of India. The hemp it affords has been by way of experiment manufactured into canvass, and the specimens were acknowledged by approved judges to be of fine quality and appearance. The Phormium Texile, or wild iris, is indigenous to Bengal, and is to be met with in all the woods of the various districts belonging to that province. The flax it yields resembles as nearly as possible that of New Zealand. The Kurah, or wild pineapple, is pos-

sessed of a fibre so remarkably delicate that the Malays can produce a cambric from it which far exceeds in quality the finest French article of that name.—*Times.*

FRENCH CUSTOMS DUTIES.

The *Moniteur* of Saturday publishes the following royal ordinance regulating the Customs Duties of France. The ordinance is preceded by a report of the Ministers to the King, explaining the circumstances which make it desirable to adopt the scale of duties recommended. They say that the Chamber of Deputies were not able to take all questions into consideration, but they have deemed it advisable to proceed upon those already considered rather than wait another year. In reference to the importation of cast iron, the report says:—"The actual tariff of the rough cast-iron (*fontes brutes*), acts in a repulsive manner upon certain products. The German cast-iron, for instance, takes a very insufficient part in our consumption, in proportion to the wants of many branches of our industry. We propose to your Majesty to yield to the representations which have been made for a long time upon this point, by reducing to four francs per 100 kilogrammes (the rate laid upon the northern frontier) the duty of six francs, which is now laid upon the eastern frontier."

With respect to the duties on linen threads, and those on marine steam engines, which more immediately concern English manufactures, the ministers observe:—

"Your Majesty will regret, doubtless, with us not to see placed among the number of the objects regulated by the ordonnance two measures which excite an almost universal solicitude in France. I mean all that concerns the use of fire machinery for international navigation, and the adoption of a new tariff for the threads and linens. The first of these measures, however, goes beyond the powers granted to ordonnances by article 34 of the law of the 17th of December, 1814. And we have refrained from taking the second from motives which I am about to have the honor of laying before your Majesty.

"When the project of law relative to the customs was to have been submitted to the Chamber of Deputies, the Government, who considered it necessary to extend the duty to about 10 per cent. upon threads, thought it proper to defer all increase of the tariff upon linens until the effect of the new taxes upon threads had been tried, and more especially until the commercial negotiations commenced were terminated.

"The opinion was shared by the committee of the Chamber of Deputies charged with the examination of the project of law. In the deeply investigating discussion which it devoted to that subject, and the results of which we find in its report, it maintained, on the one hand, that it was necessary to fix the tariff upon the threads at more than 10 per cent.; and, on the other, that it was necessary to raise the tariff upon linens in the same degree as that made upon threads.

"The Government cannot renounce its opinion upon the first point. After having taken the advice of the most competent personages, it persists in believing that a duty equivalent in value to 10 per cent. would form a sufficient protection to the thread manufactories. And as to the tariff upon linens, without refusing to acknowledge all the force of the arguments presented by the committee, we are bound to say that some of them do not altogether agree with the last facts relative to the importation of them.

"In fact, in order that the balance between the present tariff upon the threads and that upon the linens were such that the one could not be modified without putting immediately and integrally the quota of this modification upon the other, it would be necessary that the decrease which for some time past has manifested itself in the number of the importations of linen should not exceed the proportion of increase which has taken place in the importations of thread. Now, if such were the case in 1839 (since then, a million of kilogrammes of thread more having arrived, there was a reduction of a similar quantity in the linens which arrived), it was by no means the same thing in 1840. In spite of the inducements which apparently were given to the introduction of threads by the probability of a speedy increase of duty, the introduction ceased to increase. There was, even during the first eight months of this exercise, a slight diminution of 16,707 kilogrammes; and the importation of linens fluctuated 611,955 kilogrammes—an amount to which must be added, in order to calculate the importation in threads, the 15 per cent. diminution which relate to the conversion of threads into linens, so much so that, in fact, the importation of these two foreign products (linens and threads), which progressively augmented in 1838, and which, in 1839, had upon the whole remained stationary, is at the present time in a state of diminution."

The following is the Royal Ordinance founded on the Ministers' report.

"TARIFF OF CUSTOM-HOUSE DUTIES.

"Art. 1.—The tariff of the Custom-house duties shall be modified and established, for the objects hereafter mentioned, in the following manner:—

"SECTION 1.—ENTRY.

"Rough cast-iron, in masses, imported.—From Blancisseron, at Mont Genèvre, exclusively, 4f. the 100 kilogrammes; from all other points, the present duty.

"Nickel Metallique.—Of one melting, 5f. per 103 kilogrammes. Mixed with other metals (argentan)—In mass, 50f.; flattened or drawn out, 100f.

"Cork.—Raw, covered with its bark, broken up into planks, or fragments of all dimensions, 6f. Rasped.—In planks, or fragments of all dimensions, 9f.: worked, present duties.

"Stalks or filaments of the Banana Tree, Aloe Fibres, Manilla Hemp (Abaca), Phormium Tenax, and other filaceous vegetable productions not specially mentioned.—Raw, or simply deprived of their outer coating.—From the French colonies, 10c. per 100 kilogrammes; from elsewhere, 40c. Bleached or prepared for paper-making.—From the French colonies, 1f.; from elsewhere, 2f.

"Canes and reeds of French Guiana (ways).—The same duties the European reeds in whole stalks.

"Sewing needles.—8f. the kilogramme.

"Fishing-hooks.—The duty upon fine mercery.

"Box en billes, or sewed more than three decim. thickness.—Half the present duties.

"Hempen Threads, or Linen Threads of simple raw *etoupe*, furnishing more than 6,000 metres per kilogramme.—The same duties as other linen or hempen threads simples (*écrus*). All other—The present duty.

"The *fils d'étoupe* furnishing 6,000 metres or less per kilogramme can only be imported by the *ports d'entropôt réel*, by the following land frontier offices:—

"Armentières, Halluin, Lille, Baisreux, Condé, Blancmisseron, Sierch, Forbach, Strasbourg, Pont de Beauvoisin, Entre deux Guiers, St. Laurent du Var.

"In order to facilitate the distinction of the *fils d'étoupe* which remains importable according to the duty fixed by the law of the 27th July, 1822, a sample of the number forming the point of difference between this thread and that which is assimilated by the present ordonnance to the hempen and linen threads, shall be deposited at each *bureau* open to its importation.

"This sample, which shall be placed under the double seal of the departments of commerce and finance, shall serve as type in the levying of the duties, saving the appeal, in case of contestation, to the arbitrators appointed by the law of the 27th July, 1822.

"The threads of every kind which shall have received any degree of bleaching shall be reckoned as bleached threads.

"Table linen, in pieces, worked or figured, within the space of five millimetres, 16 threads, or less, present duty; 17, 18, 19, 20, or more than 20 threads, same duty as the plain linens of linen and hemp, according to the kind and quality.

"The coarse crossed linens, called treillis, shall pay like the plain linens of less than eight threads.

"No linens shall be admitted as raw which shall have received any degree of bleaching either before or after being wove, and which do not retain the decided raw color.

"Acetate of Iron.—Liquid, 5f. the 100 kilogrammes; concentrated to any degree, 40f. ditto.

"Acid of Arsenic.—12f. the 100 kilogrammes.

"Firewood.—In logs, 5c. the steré; in faggots 5c. the hundred.

"Scented Woods.—Sassafras, by French vessels, from countries out of Europe, 5f. the 100 kilogrammes; elsewhere 10f. ditto; by foreign vessels, 16f. ditto; other descriptions, by French vessels, from countries out of Europe, 25f. ditto; elsewhere, 30f. ditto; by foreign vessels, 35f. ditto.

"Angica Wood.—Same duty as the *bois de gaiac*.

"Nattes or Tresses of White Wood worked.—Same duty as the tresses of wood of 7 millimetres or less in length.

"Jarosse (podseed).—Same duty as forage.

"Millet Stalks for making brooms.—10c. per 100 kilogrammes.

"Metallic Plates of Iron.—100f. per 100 kilogrammes.

"Almanacks printed in Foreign Languages.—The same duty as French works printed in other countries.

"Printed, engraved, or colored Cards (*etiquettes*).—Same duty as lithographic drawings or ornamental engravings."

The remainder of the tariff relates to minor articles of foreign produce, and to regulations respecting French shipping.

ENGLISH SEALED PATENTS.

MONTHLY LIST.

WILLIAM DAUBNEY HOLMES, of Cannon Row Westminster, civil engineer, for *certain improvements in naval architecture, and apparatus connected therewith, affording increased security from foundering and shipwreck.*—6 months, Sept. 3.

THOMAS HORNE, of Birmingham, brass founder, for *improvements in the manufacture of hinges.*—6 months, Sept. 3.

JAMES BINGHAM, of Sheffield, manufacturer, for *certain improved compositions, which are made to resemble ivory, bone, mother of pearl, and other substances applicable to the manufacture of handles of knives, forks, and razors, pianoforte keys, snuff-boxes, and various other articles.*—6 months, Sept. 3.

WILLIAM FREEMAN, of Millbank Street, stone merchant, for *improvements in paving or covering roads, and other ways or surfaces.*—6 months, being a communication, Sept. 7.

THOMAS MOTLEY, of Bath Villa, Totterdown, Bristol, civil engineer, for *improvements in apparatus and means of burning concrete fatty matters.*—6 mths, Sept. 7.

WILLIAM COLTMAN, of Leicester, framesmith, and JOSEPH WADE, of the same place, framesmith, for *improvements in machinery employed in framework knitting, or stocking fabrics.*—6 months, Sept. 7.

JOHN WHITEHOUSE, the younger, of Birchall-street, Birmingham, brass-founder, for *improvements in the construction of spring hinges and door springs.*—6 months, Sept. 7.

SAMUEL PARKER, of Piccadilly, manufacturer, for *improvements in apparatus for preserving and purifying oils, and in apparatus for burning oils, tallow, and gas.*—6 months, Sept. 10.

MARK FREEMAN, of Sutton Common, gentleman, for *improvements in weighing machines*—6 months, Sept. 10.

PAUL HANNUIC, of Clement's-lane, London, solicitor, for *improvements in the construction of governors or regulators, applicable to steam-engines, and to other engines used for obtaining motive power.*—6 months, being a communication, Sept. 10.

CHARLES DELBRUCK, of Oxford-street, gentleman, for *improvements in apparatus for applying combustible gas to the purposes of heat.*—6 months, being a communication, Sept. 10.

EDWARD JOHN DENT, of the Strand, Middlesex, chronometer maker, for *certain improvements in clocks and other time keepers.*—6 months, Sept. 10.

HENRY HOULDSWORTH, of Manchester, cotton spinner, for *an improvement in carriages used for the conveyance of passengers on railways, and an improved seat applicable to such carriages and other purposes.*—6 months, Sept. 10.

HUGH LEE PATTINSON, of Bensham Grove, near Gateshead, Durham, manufacturing chemist, for *improvements in the manufacture of white lead.*—6 months, Sept. 10.

GEORGE ALEXANDER GILBERT, of Southampton Buildings, gent., for *certain improvements in machinery or apparatus for obtaining and applying motive power.*—6 months, Sept. 10.

ROBERT GOODACRE, of Ullesthorpe, near Lutterworth, Leicester, for *an apparatus for raising heavy loads in carts or other receptacles containing the said loads, when it is required that the unloading should take place at any considerable elevation above the ground.*—6 months, Sept. 10.

JAMES PILBROW, of Tottenham, engineer, for *certain improvements in steam-engines.*—6 months, Sept. 10.

WILLIAM BEDFORD, of Hinchley, Leicestershire, framework-knitter, for *certain improvements in machinery employed in manufacturing hosiery goods, or what is commonly called framework knitting.*—6 months, Sept. 17.

HENRY FOURDRINIER and EDWARD NEWMAN FOURDRINIER, both of Hanley, Stafford, paper makers, for *certain improvements in steam-engines, for actuating machinery, and in apparatus for propelling ships, and other vessels on water.*—6 months, Sept. 17.

MOSES POOLE, of Lincoln's Inn, gentleman, for *improvements in preparing materials to facilitate the tenching of writing.*—6 months, being a communication, Sept. 17.

WALTER RICHARDSON, of Regent-street; gent., and GEORGE MOTT BRAITHWAITE, of Manor house, Chelsea, gent., for *improvements in tinning metals.*—6 months, being a communication, Sept. 17.

SAMUEL DRAPER, of Nottingham, lace manufacturer, for *improvements in the manufacture of ornamented twist lace and looped fabrics*—6 months, Sept. 17.

WILLIAM MILL, of Blackfriars-road, engineer, for *certain improvements in propellers, and in steam-engines, and in the method of ascertaining and measuring steam-power, parts of which improvements are applicable to other useful purposes.*—6 months, Sept. 21.

CHARLES HANDFORD, of High Holborn, tea-dealer, for *an improved edible vegetable preparation, called "Eupooi," and the mode of manufacturing the same.*—6 months, Sept. 21.

THOMAS PAIN, jun., of Upper Seymour-street, Euston-square, student at law, for *a plan by means of which carriages may be propelled by atmospheric pressure only, without the assistance of any other power, being an improvement upon the atmospheric railway now in use.*—6 months, Sept. 22.

JOHN MAUGHAN, of Connaught terrace, Edgeware-road, gent., for *certain improvements in the construction of wheeled carriages.*—6 months, Sept. 24.

GEORGE GOODMAN, of Hanley in Arden, and of Birmingham, needle manufacturer, for *certain improvements in the manufacture of mourning and other dress pins.*—6 months, Sept. 24.

JOHN GIBSON and THOMAS MUIR, both of Glasgow, silk manufacturers, for *improvements in cleaning silk and other fibrous substances.*—6 months, Sept. 24.

WILLIAM HIRST, of Leeds, clothier, for *improvements in the manufacture of woollen cloth, and cloth made from wool and other material.*—6 months, Sept. 24.

PIERRE ERARD, of Great Marlborough-street, for *improvements in pianofortes.*—6 months, Sept. 24.

HENRY PINKUS, of Panton-square, Esq., for *improvements in the methods of applying motive power to the impelling of machinery, applicable amongst other things, to impelling carriages on railways or common roads or ways, and through fields, and vessels afloat, and in the methods of constructing the roads or ways on which carriages may be impelled or propelled.*—6 months, Sept. 24.

JOHN JOHNSTON, of Glasgow, gent., for *a new method, by means of machinery, of ascertaining the velocity of or the space passed through by ships, vessels, carriages, and other means of locomotion, part of which is also applicable to the measurement of time.*—6 months, Sept. 24.

THOMAS ROBINSON WILLIAMS, of Cheapside, gent., for *improvements in the manufacture of woollen fabrics, or fabrics of which wool, furs, or hairs are the principal components, as well as for the machinery used therein.*—6 months, Sept. 24.

ALEXANDER DEAN and EVAN EVANS, of Birmingham, millwrights, for *certain improvements in mills, for reducing grain and other substances to a pulverised state, and in the apparatus for dressing or bolting pulverised substances.*—6 months, Sept. 24.

FREDERICK PAYNE MACKEKAN, of Birmingham, for *certain improved threshing machinery, a portion of which may be used as a means of transmitting power to other machinery.*—6 months, Oct. 1.

THOMAS JOYCE, of Manchester, ironmonger, for *a certain article which forms, or may be used as a handsome nob, for parlor and other doors, bell pulls, and certain pins, and is also capable of being used for a variety of useful and ornamental purposes in the interior of dwelling-houses, and other places.*—6 months, Oct. 1.

SPECIFICATIONS.

ENTERED AT THE ENROLLMENT OFFICE.

(Continued from page 197.)

THOMAS CRADDOCK, of Broadheath, near Presteign, in the county of Radnor, *a certain improvement or improvements in steam engines and steam-boilers*, Sept. 16.—The improvements in steam-engines consist, first, in an improved mode of obtaining a rotary motion from the rectilinear and reciprocating motion of the piston rod; and, second, in an improved method of condensing steam.

The improvements in boilers consist in an improved construction of boiler, and in an improved method of regulating the generation of steam.

First claim is to the mechanical arrangement of the apparatus delineated and described, whether employed for converting the rectilinear into the rotary motion, or the rotary motion into the rectilinear. In this improvement, the piston rod carries two toothed racks, one being behind, on one side of the other; one of these toothed racks works into a pinion, which pinion takes into the teeth of a drum, which is firmly keyed on the main shaft, which drum has teeth over half its circumference on one side, and over the remaining half of its circumference on the other side. The mode of working is as follows: by the up-stroke of the piston rod, the pinion, taking into the teeth on one side of the drum, brings it half round, and is released; then by the returning stroke of the piston rod, the other rack takes into the teeth on the other side of the drum, and finishes the stroke in the same direction.

Second claim is to the exclusive right of condensing the steam or vapor of water, or other liquids, by causing it to pass into metallic tubes, of small diameter, or into metallic vessels of any other suitable figure, which tubes or vessels are put in motion, either rotative or otherwise, either in air or water, independently of any motion of the carriage, boat, or vessel, to which the condenser may be attached, whereby the condensation of the steam or vapor is greatly accelerated. This condenser is composed of two chambers, connected by a bar, and supported by hollow axes revolving in bearings, which axes are connected, the one with the eduction pipe of the engine, the other with a hot well, or reservoir. From each chamber a number of hollow arms diverge, which are connected together by a series of rings; the two sets of rings are likewise connected together by small tubes, reaching across several times.

The condensing is performed as follows: the steam, after operating on the piston, is introduced through the chamber into the tubes; the condenser is then caused, by bearings from the engine, to revolve with great rapidity, by which means the caloric is abstracted and the steam condensed; the water resulting from which is conveyed from the other chamber, into which it flows, through a pipe into the hot well; from whence it is drawn by the feed pump into the boiler.

Third claim.—The construction and arrangement of the parts constituting the boiler.

Fourth.—The use of a separate cylinder to supply both air and fuel to the furnaces, and regulating the supply of steam to the cylinder by the pressure of steam in the boiler, in such a manner that as the pressure increases, the supply of steam to the cylinder is diminished, thereby diminishing the supply of air and fuel to the furnace. The boiler is composed of two furnaces, the sides of which are formed of ranges of hollow tubes, which are full of water, communicating at the top and bottom with rectangular reservoirs; the bottom is formed of smaller tubes, extending horizontally from one reservoir to the other, and acting as fire-bars; the top is likewise composed of tubes extending from one reservoir to the other; the ash-pit is a tank filled with water, which, by the heat from the fire-bars, evaporates, and passing up a tube into the condenser, is there condensed; thereby supplying any loss from leakage. The fuel is conveyed into the furnaces by shoots from two hoppers; upon being thrown into the hopper, it falls upon two fluted rollers, which are worked by the pinion that drives the fan, it then falls through or between these rollers, and down the shoot upon a swinging plate, which scatters it over the surface of the fire. The wind passes from the fan through a pipe to the bottom of the fire-bars. When the steam gets beyond the regular working pressure, it shuts the valve which supplies the fan cylinder with steam, and escapes through another opening into the atmosphere, whereby the pinion that works the fan is either stopped, or works very slowly, by which means the supply of air and fuel to the furnaces is very much decreased or cut off altogether; when the steam has returned to the regular working pressure, it is again admitted to the fan cylinder, which works as before. There is a suitable opening, provided with a cover, for the admission of the fire, and likewise a tube with an eye-piece of talc for viewing the fire when required. There is likewise a contrivance for burning the smoke arising from the coals when newly thrown on the fire; it operates in this manner—there is a tube which communicates with the two shoots, and at the bottom of each furnace there is a valve for shutting off the supply of air; when one or both of the furnaces have burnt bright, and fresh fuel is required, the supply of fuel and air is shut off from the other one; the smoke arising from the fresh fuel is driven, by the force of the air from the fan, through the flue into the other furnace, where it passes through the fire, and is consumed.

JEAN FRANCOIS VICTOR FABIEN, of King William-street, in the city of London, *improvements in*

rotary engines, which may be worked by steam or other fluids, Sept. 16.—This invention is a new high pressure rotary steam-engine, working expansively, and giving the shaft a direct motion.

The engine is composed of a horizontal cylinder, having the eduction and exhaustion pipes cast with it. On the shaft revolving in the cylinder is keyed the piston, being a cylindrical boss, having two diametrical plates, whose surfaces are curved so as to allow a perfect contact with the slide, which is the fulcrum of the steam working expansively here. The piston is within two vertical plates, having their circumference provided with circular carved segments, concentric with the piston. having for their radius that of the cylinder; their internal surfaces which are not occupied by the piston, rub against the lateral slide segments of rectangular section, rubbing against the internal surfaces of the two plates. The slide is put in motion by two transverse rollers, revolving in a lever, affixed to the shaft at each side of the engine, and working in a curve, calculated to cause the sliders to follow the piston in all its positions by their alternate horizontal motion. The circular plate, which accompanies the piston in all its positions, rubs against the surface; by which disposition it nullifies any communication of steam between its eduction and exhaustion, till it has produced its effect. The admission of steam is regulated by two conical valves of a peculiar curve, acting in a frame and catch that opens and shuts the eduction of steam by a conical valve; when it is put in motion by a disengaging lever, by which the engine may be stopped when required.

William Crofts, of Radford, in the county of Nottingham, machine maker, *improvements in machinery for the purpose of making bobbin net or twist lace, and other ornamental fabrics, looped or woven*, Sept 16.—First claim.—The mode of constructing the guides and guide-bars, as herein described.

Second.—The mode of producing the up and down motion of the guide points, as herein described.

Third.—The mode of using two pattern surfaces, thereby allowing one to be changing its position during the time the other is coming into action.

Fourth.—The using independent selecting instruments, by operating on them in classes, in place of separately, by the pattern surface, whereby the pattern surface required to repeat patterns over the machine is greatly reduced in twist lace or bobbin net machinery, using independent selecting instruments.

Fifth.—The using independent selecting instruments, by operating on them in classes, in place of separately, by the pattern surface, whereby the pattern surface required to repeat the pattern over the machine is greatly reduced in warp lace machinery, using independent selecting instruments.

Sixth.—The mode of constructing pattern surfaces, as herein described.

From what is to be learnt from the specification, it appears that the patentee does not propose to bring forward many new things, but to use the old machinery in a different manner to the usual one. Of the new portions of machinery are the guides, and guide-bars for the threads, mentioned in the first claim, which, though the same in every respect, by working in an inverted arch keep an equal distance between each of the threads. The using two pattern surfaces is likewise new, by means of which as soon as one has performed its part, and the pattern is required to be changed, the other is acting. To explain the manner in which the patterns are changed so expeditiously, it will be well to describe the pattern surface, which is enclosed in a cylinder; the pattern surface itself is a cylinder, with the surface perforated at equal distances with small holes, into which the blocks forming the pattern are placed. The blocks are intended to act as type; so that the pattern may be changed by a different arrangement of the same blocks. The patentee likewise proposes a new mode of using independent selecting instruments, by operating on them in classes, by means of the improved pattern surface, instead of separately, as in the old method, by which means the pattern is repeated over the machine with a great reduction of pattern surface; this method is applicable to twist lace or bobbinet machinery, and likewise to warp lace machinery.

Samuel Seaward, of the Canal Iron Works, Poplar, engineer, *certain improvements in the construction of steam-engines, and in the application of steam-engines to propelling ships and vessels*, Sept. 17.—First claim.—The piston, with arms projecting through the sides of the cylinder, and working in grooves therein, with a connecting rod, by which motion is given directly to the crank or beam of the engine. without the intervention of a piston rod, parallel motion mover, or any other analagous contrivance; also the method of making the grooves air and steam-tight. In this improvement, the piston has no rod, a bar extends from each side of it, through the sides of the cylinder, and works in a groove exactly the length of the stroke of the piston; the sides of the groove are composed of two flanges, an oblong breast-piece, with a circular hole through its centre, is passed over each bar and works in the groove; a long narrow plate, twice the length of the piston stroke, with a hole in its centre, is fixed on to the bar, and works with it in the groove, covering it completely, and so preventing the escape of steam; two legs extend from the bars of the piston to a cross-head, to which is attached the connecting rod that turns the cranks of the engine.

Second claim.—The mode of reducing or augmenting the speed of the paddle-wheel, whilst the engine is working at its maximum effective speed, or nearly so, by fixing on the engine and paddle shafts three sets, or more, of toothed wheels and pinions of proportional diameter; the power of the engine is conveyed to the paddle-wheels by one or the other of these sets of gearing;—also the method of disconnecting entirely the paddle-wheels from the steam-engine, by throwing the whole of the said wheels and pinions out of gear.

In this, the main shaft turns in bearings in the side of the vessel, instead of the spring beams in the side of the paddle-boxes; the paddle shaft is placed at a convenient distance, either above, or on one side of the main shaft. The main shaft carries three pinions of the relative size to one another, as 1, 2, 3, which are put in and out of gear by sliding adjusting levers; the paddle-shaft carries three toothed wheels, of the relative sizes of 4, 5, 6, into which the pinions take; the largest of the pinions 3, being of the same size as the smallest toothed wheel, 4. When the engine is acting, if the pinion 3, and the toothed wheel 4, are thrown into gear, then the paddle-wheel makes as many revolutions as the driving crank of the engine, say 20; if, instead of them, 5 and 2 are thrown into gear, the paddle-wheel makes only 17 revolutions; and if a still slower motion is required, then 1 and 6 are thrown into gear, and the number of revolutions is 14; by throwing the wheels and pinions out of gear, the paddle-wheels are entirely disconnected from the engine.

Third claim.—To the expanding piston, whereby the stroke of the piston may be changed in the same cylinder, without any loss of steam taking place. In this improvement, the piston is composed of two parts, each having its separate packing; and being of the same extent as the superficial area of the cylinder, it has a centre piece between the two which is firmly keyed on the piston rod; through this centre piece work three screws, which are used to keep the cylinder in any one required size, or to increase or decrease it; the top part of each screw has a right handed thread, and the bottom part a left handed thread; by turning which screws to the right hand or to the left, the two parts of the piston are made to approach or recede from one another; thereby increasing or decreasing the size of the piston.

Fourth claim.—The employment of two cranks for propelling purposes, and for driving machinery in general, wherever applicable, the one called the main, or driving crank, having a sliding crank pin, the other called the driven crank, having oblong collars with parallel sides for the reception of the said crank pin, whereby the throw of the main crank may be altered at pleasure, or disconnected entirely, should it be deemed advisable.

In the head of the crank pin is fixed a strong nut, through which a screw passes, the lower end of which is housed in the boss of the main shaft, and the upper end extends above the head of the driving crank; the driven crank has two oblong collars for the reception of the crank pin, the space between the two being open at the bottom; to disconnect the cranks, the crank pin is lowered, by turning the screw, by which means the pin is released from the oblong collar, and the two cranks revolve independently of one another.

Fifth claim.—The connecting or disconnecting of two cranks, by attaching a strong jaw and slide to the driven crank with a screw to move it backwards and forwards; by turning this screw to the one side or the other, the main crank pin is held firmly by the jaw of the slide, or liberated from it, allowing the two cranks to revolve, the one independent of the other. The driven crank is provided with a strong jaw and slide, which is raised or lowered by a screw in the manner before described; the surface of the jaw is hollowed out, by which it is enabled to take a firmer hold of the crank pin; to disconnect the two cranks, the jaw is lowered by turning the screw, which releases the crank pin.

Sixth claim.—The connecting and disconnecting of two cranks, by means of a moveable circular head, or moveable head of any other suitable form, attached to the boss or end of the driven crank, which head has a recess in the surface thereof, for the reception of the toe of the crank pin ot the driving crank, by turning which head to the one side or the other, the recess is made either to coincide with, or cross the line of rotation of the main crank pin; thereby holding it firm in the recess, or letting it move freely round, without interfering with the driven crank. In the end of the driven crank is attached a moveable circular head, having at the back two pins, which move round in two grooves, in the face of the driven crank, and in the shape of a quarter of a circle, thus restricting the movement of the head to the same. In the face of the head is a recess, in form of the segment of a circle, for the reception of the toe of the driving crank, which has its sides flattened, in order to take a better hold; by turning the moveable head, the recess either corresponds with the line of rotation of the crank pin, or holds it firm in the recess.

ENTERED AT THE PETTY BAG OFFICE.

(Continued from No. 61.)

William Craig, of Glasgow, engineer, and William Douglas Sharp, of Stanley, county of Perth, engineer, *improvements in machinery for preparing, spinning, and doubling cotton, flax, wool*, Aug. 31.—Claims, first, peculiar arrangement of machinery for "backing off," and for "putting up" the carriage.

A pair of mitre wheels are so arranged as to give motion to a diagonal shaft; this shaft drives on another shaft a bevelled wheel, turning loose, connected on one side by a catch, and on the other side by a catch plate, there is also a "backing off" pinion and catch plate, turning also loose, on the same shaft; to this catch plate are fixed studs, one of which is taken hold of by a proper pin, fixed in the catch plate connected with the bevelled wheel.

Second.—The application of a toothed rack, for depressing the "faller," and for backing off the coils of yarn from the surface of the spindles.

The carriage having arrived at its greatest distance, a pin attached to it presses a strong lever, and causes the elevation of a toothed rack, so as to bring the teeth in contact with a pinion, which revolves and causes a further elevation of the toothed rack, which then passes a lever, and an inclined plane fixed to the rack comes in contact with an anti-friction roller, and causes the depression of the faller; when the faller wire has arrived at the ends of the spindles, the lower part of the

toothed rack has come in contact with a pinion on the twist shaft, which then revolves and gives the backing off motion to the spindle.

Third.—The arrangement of the inclined plane, in connection with the toothed rack.

Fourth.—The construction and application of a double eccentric pulley, for putting up the carriage.

This is done with a double eccentric pulley, so constructed as gradually to increase in speed towards the middle of the stretch, and then gradually decreasing in speed, until it reaches the roller beam.

Fifth.—The method by which the motion of the mule is changed, on the carriage reaching the roller beam.

This consists in a spring being made tense, and retained by a catch, during the outgoing of the carriage; when the carriage, reaching the roller beam, it releases the spring from its retaining catch, and produces the required motion by acting on levers.

Sixth.—Two new modes of winding yarn on the spindles.

One mode is by a scroll or spiral pulley, unwinding the band from the commencement of the cop; another mode is by winding the yarn on the bare spindle; the band is unwound to an almost parallel portion of the pulley, and as the cop bottom increases in diameter, the band begins to unwind, to a greater diameter, and thereby decreases the number of revolutions given to the pulley on the going out of the carriage.

ETIENNE ROBERT GAUBERT, Paris, *improvements in machinery for distributing types into proper receptacles, and placing them in order for setting up, after they have been used in printing*, Sept. 10.—The type is placed promiscuously in a heap, on an inclined plane; this plane has a shaking motion communicated to it by any suitable contrivance, which motion causes the type to slide on to another inclined plane, divided by oblique bars, and leading to directing passages or grooves, which are closed at the bottom by moveable stops, these stops are raised and lowered alternately by a backward and forward movement of transverse bars, in order to prevent more than one type escaping at the same time through the bottom of the passages; beyond the passages are openings, in an inclined position, the exact size of the type, with two small studs placed inside, in different positions in each opening; the type must be made with notches in each, to correspond with the studs in its particular openings, so that the type will slide singly down, until it reaches its proper place, where the notches correspond with the studs; when it will fall through, and be carried away through diagonal passages into the compartments of a plate underneath.

THOMAS TASSEL GRANT, Her Majesty's Victualling Yard, Gosport, Southampton, *improvements in fuel*, Sept. 24.—Consist in a combination of small coal with coal tar, or other bituminous matter, which, being heated, is reduced to the substance of hot pitch, two gallons, or 20 lbs. of which is combined with every hundred weight of coal dust, and the material moulded like bricks.

SAMUEL KNIGHT, Woodhouse Mills, Lancaster, bleacher, *improvements in machinery for boiling, bucking, and scouring, for the purpose of preparing and assisting the process of bleaching, cotton, linen, and other fabrics*, Sept. 24.—The goods to be operated upon are packed in suitable vessels upon a grating, and the liquid enters at the top by a pipe from a boiler; and, running through the goods, escapes from the bottom by another pipe into the boiler again, which is repeated as often as necessary. Several vessels full of goods may be operated on at the same time, by having them placed between two boilers with communicating pipes, for the purpose of alternately filling and exhausting them.

WILLAM NEWTON, Chancery-lane, civil engineer, *improvements in strengthening and preserving ligneous and textile substances*,—being a communication from a foreigner, Sept. 19.—The ingredients used in these improvements consist of, in the first place, Galic acid, tan, and tannin, from oak or any other class of the vegetable kingdom that contains it, or will yield it by infusion or any other process. In the second place, such oily, albuminous, and gelatinous matters, produced either from the vegetable or animal kingdom, as the first named ingredients are capable of coagulating, drying, or rendering solid. If a fine paint be required, extract of tannin well compounded or mixed with oil should be used; if a coarse or thick coating be wanted, the same oily matters may be used, with the addition of pulverised bark either of oak or pine, with pitch, resin, bullocks' blood, fecula, &c., in proportion to the degree of durability or solidity required. The above ingredients should be prepared as much as possible without the employment of heat. For preserving ropes or cordage, the use of simple tan will be found far superior to tar, as usually employed.

PETER BANCROFT, Liverpool, merchant, and JOHN M'INNES, Liverpool, manufacturing chemist, *improved method of restoring animal charcoal after it has been used in certain processes*, Sept. 22.—Claim the method of restoring the properties of animal charcoal, and rendering it fit for use by the employment of an alkali.

In order to dissolve, and carry off the coloring matter, and other impurities left in the charcoal, after it has been employed for discoloring syrup or other processes, let the charcoal be well washed and afterwards saturated with a solution of caustic, potash, or soda; the specific gravity of which should be about 1·06, then let it repose for a few hours. The caustic alkali, which will then contain the coloring matter and other impurities in the charcoal is to be drawn off, and the charcoal is to be washed with a continuous stream of hot water, until it runs perfectly colorless, and free from all alkali, which may easily be ascertained by any of the well-known tests.

JOSEPH CROSFIELD, Warrington, Lancaster, soap-maker, *improvements in machinery or apparatus used in the manufacture of plate glass*, Sept. 23.—Claim first. The construction of a reverbatory furnace, so that the flame may act upon the raw material, or cullet, without the intervention of a pot, thereby effecting a saving of fuel, and also the cost of the pots.

The furnace is constructed with an inclined bottom; at the highest end is the fire, separated from the cullet by a bridge, over which the flame passes on to the material; which, as it becomes fluxed, flows down the inclined bottom of the furnace through a fire-clay pipe into a pot which is kept heated by the same flame.

Claim second. For a novel construction of grinding benches with their runners, which are moved by one crank, being the same that moves the fly frame.

These benches with their runners are constructed in the usual manner, only there are four of them, and they are placed at right angles to each other, and are moved from the centre through a simple apparatus by the same crank that moves the fly frame, thereby saving labor and expense of machinery.

Claim third. For the application of additional polishing bars.

These polishing bars are of the same construction as those used in ordinary machines. The improvement consists in using one or two more than are usually employed at the same time; four is the number that answers best, and will be found not only to produce a better polish on the glass, but to polish a greater quantity in the same time.

CAPTAIN JAMES HAY, Belton, Haddington, Scotland, *improvement in ploughs*, Sept. 24.—The improvement consists in such a construction of ploughs, that they may be used in a reversed direction, without turning the body of the plough.

To the body two mould boards are fixed on the same side of the plough; two shares are also fixed to the extremities, with their cutting parts on the same side as the mould boards. To the body are also fixed handles, a beam, bridle, and coulter, which revolve on a bolt fixed in the centre of the top of the body of the plough; when the handles, beam, &c., are required to be stationary, they are secured by iron glands connected with a rod, which forms a handle at the outer end.

When the ploughman wishes to reverse the motion of the plough, he draws the rod by the handle towards him, thereby unlocking the glands, which turn vertically at the connecting points; then by the horses turning towards the spot where the ploughman stood, they carry round the bridle, handles, beam, and coulter, (which revolve horizontally) until they are in the opposite direction to that in which they were before. The man then pushes the rod, which locks the plough by acting on the glands, and it is ready to be worked in a reverse direction.

NOTICE.

In accordance with the determination expressed in our 26th Number, of giving one month's clear notice to Inventors, before publishing their specifications, we hereby inform the following Patentees, that their specifications will be published in the "INVENTORS' ADVOCATE" of Nov. 7. Each party will receive, in addition, a *private* communication to the same effect.

William C. Wilkins and Matthew S. Kendrick, of Long Acre, lamp manufacturers, due Oct. 28.
John Tukson, of Ryder street, St. James's, due Oct. 30.
Orlando Jones, City-road, accountant, due Oct. 30.
William Pierce, James-place, Hoxton, ironmonger, due Nov. 2.
Arthur Wall, Bermondsey, surgeon, due Nov. 2.
Thomas G. Matthews, and Robert Leonard, merchants, Bristol, due Nov. 2.
William Newton, Chancery lane, due Nov. 5.
George Mackay, Mark-lane, ship broker, due Nov. 5.
William Beetson, Brick-lane, Old-street, brass founder, due Nov. 5.
Frank Hills, Deptford, manufacturing chemist, due Nov. 5.
Bernard Aube, Coleman-street-buildings, due Nov. 7.
Thomas Walker, of Gabashiels, Selkirk, mechanic, due Nov. 7.
Henry Holland, Darvin-street, Birmingham, umbrella furniture manufacturer, due Nov. 7.
Henry Montague Grover, of Boveney, Buckingham, clerk, due Nov. 7.

FOREIGN INTELLIGENCE.

FRANCE.

We are glad to find that the reports of the harvest from all the departments are most favorable. In the department of the Seine and the environs of Paris, the produce of the wheat crop is represented to be abundant. In the departments formed out of the ancient provinces of Beausse, Brie, and Picardy, which usually supply the Paris markets, the corn is reported to be very fine in quality, and the quantity good. In the provinces of Flanders and Lorraine, the harvest is said to have been "magnificent." In short, from every department, the accounts are extremely favorable. Brittany and Normandy seem to be the only provinces which form exceptions to the general abundant produce, which is said to be greater than has been known for many many years.

The cotton manufacturers in the neighborhood of Mulhausen have had a general meeting in that town, to consider the means to be adopted for improving their business, which is at present in a

depressed condition. It appears that they recently memorialised the government to make alterations in the custom duties, for the purpose of encouraging the cotton manufactures of France, but their representations were not attended to. At the recent meeting it was agreed again to urge their claims on the government for protection, and the following measures were recommended for adoption:—That the manufacturers should have the privilege of importing directly American cotton bought in any of the European markets; that the extra duty on cotton imported in foreign ships should be reduced from 10 frs. to 5 frs.; that Egyptian and Turkey cotton should be admitted into Marseilles at a low duty when brought in French ships from any port in the Mediterranean; and that the drawback on linen threads and cloths, when exported, should be raised from 25 frs. to 40 frs. It was also proposed to appoint an accredited agent at Paris, to look after and protect the interests of the extensive cotton manufacturers in the eastern provinces.

Some experiments with flying bridges and boats were made a few days ago upon the Rhine, near Strasburg. In the first instance, a bridge of a new construction for the passage of troops was thrown over in 20 minutes. Three flotillas of boats, supported by a gunboat, were next brought forward in regular order to represent the passage and debarcation of troops. At the same time a flying bridge, capable of bearing 300 men, came down the stream, and, fixing its anchors in the middle, by the mere force of the current expanded its arms, and in three minutes reached from bank to bank. The next experiment was with a bridge of boats, which, in an hour and a half, would enable an army to cross a wide river. The last experiment was an attempt to pass under the bridge in very small and light boats, so as to defy the power of the current. Several men, after having directed their course to the bridge, lay down in the boats, and passed rapidly and safely under the bridge.

RAILWAY INTELLIGENCE,
DOMESTIC AND FOREIGN.

The Great Western Railway.—The extraordinary speed with which his Royal Highness Prince Albert travelled on the above line of railway, on the occasion of his visit to the late Princess Augusta, on Monday se'nnight, is, perhaps, the greatest that has yet been attained on that or any other railway. It averaged nearly a mile per minute. In allusion to the extraordinary speed of the train, his Royal Highness on his return from Clarence House to the terminus at Paddington, was heard to observe to the directors, as they were handing him into the saloon.—"You travel very fast on this line; not so fast back, if you please." The line will, we understand, be further opened, before the end of the year, to Wootton Basset, and from Cheltenham to Cirencester, and the entire length of the railway on the 1st June next (1841).

Effects of Railroads.—The Government have taken possession of the tollbars on the Great North road, near Stamford, under the following circumstances:—The trustees of this road have expended £6,000 in widening the carriage-way, cutting down the hill, and making a new bridge at Great Casterton. In order to effect this, they borrowed £1,000 from the Exchequer Loan Office in 1834, the interest of which has not been paid since 1836. Of late the railroads have so reduced the traffic on these roads as to place the trustees in great difficulty, and the Government has issued an extent in aid, under which they have put their own receivers into the tollhouses, and apply the proceeds to the payment of the sum.—*Lincoln Chronicle.*

Bristol and Exeter.—A Special General Meeting of this Company was held on Tuesday, at Bristol, to finally determine on the expediency of granting a lease of the Bristol and Exeter Railway to the Great Western Railway Company, on the terms submitted to the last half-yearly general meeting of the proprietors. A long and animated discussion took place, and on a show of hands the numbers appeared so equally balanced, that the chairman said he could not decide. A poll commenced, and was carried on the following day. The votes in favor of the resolution for adopting the lease were then declared to be 3,550; against the resolution, 1,104.

Sunday Travelling on Railways.—An "agitation" is getting up at Cheltenham against Sunday travelling on the Birmingham and Gloucester Railway. At the head of the party is the Rev. Mr. Close, who, in the local papers, has addressed his townsmen on the subject, his most prominent argument being the apprehended injury to the prospects of Cheltenham as a place of fashionable resort, should facilities be afforded to the *canaille* of Birmingham and Worcester to pay it a Sunday visit!

American Locomotives.—Mr. Norris, the American engineer, has shipped five locomotive engines from New York to England, for the use of the Gloucester and Birmingham Railway. These engines have greater power than the English, and cost about £1,800 each.—*Worcester Chronicle.*

On Tuesday night a shameful outrage took place on the Eastern Counties Railway, at Brentford. It appears that shortly after 12 o'clock, one of the ballast engines was drawn up alongside the Brentwood station, and the engine drivers and stokers had left her for a short time, before taking the fire out for the night. They had been gone but a few minutes when a man, named Thorogood, a carpenter residing at Brentwood, who was intoxicated, got over the palings of the station, and having mounted the engine, turned the steam on, and then leaped off and ran away. The Brentwood station is situated about 500 or 600 yards on the London side of the present termination of the Eastern Counties Railway, where the company are cutting through an immense hill leading to the estate of the Right Hon. Lord Petre, through which it is intended the line shall pass to Chelmsford and Colchester. Fortunately the engine went in that direction. In its progress it dashed a horse box and truck laden with coke stationed on the line to pieces, and then continued its course until it reached the hill alluded to, where its further progress was impeded, but its velocity was so great that it was embedded in the earth to the depth of several feet. On discovering what had happened an immediate pursuit was made by the engineers, and Thorogood being found in the neighbourhood, was accused, and admitted the fact of having set the engine going. He was given into custody of the police, and it is understood he will be prosecuted by the company. The damage sustained is estimated at between 40*l.* and 50*l.*

RAILWAY ACCIDENTS.

It is, we understand, the intention of one of the most able and influential men in the Corporation of London, to bring the subject of the numerous dreadful accidents which have occurred upon railroads, under consideration in the Court of Common Council, with the view to petition Parliament, or adopt some other measure to diminish the hazard to life and limb. It is the opinion of the gentleman to whom we allude, that the Government should appoint a board of the most eminent engineers in England, who should be empowered to call before them all the engineers employed by the several railway companies, and examine them as to their knowledge of engines, and to their other qualifications; that the board should give certificates as to the capabilities of those who should undergo such examination, and that those who were not approved of should be discharged.—*Sun.*

Blackwall.—The poor man, John Hill, who on the 8th of this month received some severe injuries by the breaking of the rope on the Blackwall Railway, expired at the London Hospital on Saturday evening last, from the effects of his injuries, so that this will make the second death that has occurred at this institution within the week from railroad accidents.—On Tuesday the rope, which draws the carriages on this railway broke again about half-past eleven o'clock in the morning, a short distance from the Stepney station. The sudden shock the train received was very great, although fortunately no one sustained any injury; the passengers were, however, very much alarmed. The accident caused upwards of an hour's delay.

London and Birmingham.—An accident on this railway happened on Tuesday week. The up-train left the Aylesbury station at 12 o'clock, and arrived in about a quarter of an hour at the station at King's Langley, a distance of seven miles. 500 or 600 yards nearer London there is a footpath or right of way across the railway leading into the town, on which a hairdresser, named Ginderfield, was traversing at the moment the train started from King's Langley, and being alarmed, instead of remaining on the down line, he ran forwards, attempting to cross the up-line, when, although the driver endeavored to check the speed of the engine, he was driven forwards by it several yards, and at last falling was literally cut to pieces by the wheels of the carriages passing over his body.

At Horsfall Tunnel.—Yesterday afternoon a dreadful accident occurred at this tunnel, upon the Manchester and Leeds railway, near Todmorden, occasioned by one of the props giving way. Two of the workmen were buried in the earth, and were both taken out quite dead.—*Halifax Guardian.*

A frightful and fatal accident occurred on the Great Western Railway yesterday:—It appears that a cowkeeper, named Robert Ruddell, aged 80 years, had been in the habit of crossing the line in pursuit of his avocations at Gravil-pits, Keynsham, and on this occasion he was induced, at the request of one of the police, who knew that he was deaf and feeble through his great age, to sit down on a post until after the five o'clock up train from Bristol to Bath, which was momentarily expected, should have passed. He, however, unfortunately left his seat too soon, and got between the rails just as the train came in sight, and the whole train passed over him, causing his instant death and terrible mutilation.—*Devizes Gazette* of Thursday.

Eastern Counties.—An inquest was held on Friday, at the London Hospital, on the body of John Perrey, aged 57, a silk-dresser of Spitalfields, who died on Wednesday, from the effects of injuries received on the 14th instant. Mr. Duncan, solicitor to the company said the accident happened by the Eastern Counties train being overtaken by an engine, tender and carriage, belonging to the Northern and Eastern Counties Railway. Both railways have the same terminus, and the same line to a certain distance. The single carriage of the Northern and Eastern Counties Railway was conveying the engineers, Messrs. Braithwaite and Stephenson, and Mr. Bidder, the railway calculator, (formerly known as the celebrated "calculating boy"), to examine the junction of the two lines (the Northern and Eastern and Eastern Counties Railway), near Stratford. The regular Eastern Counties train, consisting of four carriages, the engine and tender, had stopped at the Bow station, near the East London Waterworks, when it was overrun by the engine, one carriage and tender, conveying the engineers. No one was thrown out by the concussion, nor was either train thrown off the line. Deceased was in the last third-class carriage of the Eastern Counties train, and he was forced by the shock against the last first-class carriage next to which he was sitting. —George Miles who was in the same carriage as the deceased at the time of the accident, confirmed Mr. Duncan's statement as far as it went. He said that when the collision took place, the effects were terrible. There was a frightful crash, that doubled up the seats and smashed them in. He did not know what had happened to deceased, for he himself lost his senses in consequence of a blow on the loins. When witness recovered he saw deceased with his face strapped up in a cart about to be conveyed to that hospital. Saw no signal, heard no

whistle, and did not notice any policeman on the line from Devonshire-street to Old Ford, where the concussion took place. There were two persons, he believed engineers, in front of the engine that came upon them, and they (the engineers) seemed to slacken their pace as they came up. Mr. Hall, the managing director of the railway, said, that when one engine follows another on the same line of rails, the driver of the engine following should keep at the distance of at least 500 yards from the first engine. Mr. Henry Tristram, resident engineer to the Eastern Counties Railway Company, said that the value of a railway engine was 1,300*l*. The engine that caused the accident was borrowed from that company, and the two men who worked it were in their employ. They were competent persons, and were fully aware of the regulations of the company. It was the duty of the engine drivers to have reversed their engines as soon as they came in sight of the stopping train. Their not having done so was the cause of the accident. Witness was in the first train, and the engineer of it had given the usual warning (the whistle) that he was about to stop. He thought the cause of the collision was, that the men in the second engine did not take proper precaution in stopping in time.—In consequence of the absence of Mr. Elsham, superintendent of the locomotives, the inquest was adjourned till Wednesday. On that day the inquest was resumed, and a verdict of "accidental death" without any deodand, was recorded. The jury contented themselves by requesting the Coroner to *reprimand* the engine-driver. The *Essex Mercury* makes the following remarks in reference to the effect the recent accidents on this line have had in diminishing the traffic. "The rapid succession of accidents on this line, it may be hoped, has now ceased; but how to tranquillise the public mind, and restore confidence, is a question. The trains, which before the Brentwood accident were so much crowded, now pass to and from the line with but few passengers, whilst every coach and omnibus on the turnpike-road is crowded. The railway has increased the traffic into the Eastern Counties tenfold; and now, by the late deplorable accidents, the traffic is thrown back on the turnpike-road far beyond what the old conveyances can accommodate. This state of things is much to be deplored, and has occasioned considerable inconvenience to the public; but the Company cannot expect that the public will put themselves in harm's way, until something is done to satisfy them that all is right. The causes of the late frightful accidents are variously accounted for, and many rumors are afloat."

FOREIGN RAILWAYS.

France.—The French seem to be endeavoring to make amends by present activity in railway operations for their former supineness. Not more than a fortnight ago the railway on the left bank of the Seine to Versailles was opened; and since then another railway, connecting Paris with the provinces, has commenced working. The railway from Paris to Corbeil, a town twenty English miles to the south of the capital, is the one to which we allude. The distance is performed by the locomotive engines in forty-three minutes, which fully equals the speed ordinarily obtained on our railways. The construction of the work presented but few engineering difficulties, as the line is carried along the level of the Seine. At one point, however, Choisy-le-Roi, it crosses the Seine, on an iron viaduct of eight arches. This railroad is not likely to answer if it terminate at Corbeil, but it may be regarded as the first link of the chain that is to connect Paris by railroad with Bordeaux and Lyons; in which point of view it presents every prospect of success. In the present military fever of the Paris papers the establishment of these means of communication are regarded with more interest in a military point of view than for their commercial advantages. The *Journal des Debats* observes:—"It is not only the commercial utility of railways that must be looked at, it is, more especially, their importance as making military roads through France, that ought to be regarded. By this means our forces will be augmented by enabling us to concentrate troops in a few hours on any point that may be menaced. Whilst we are in expectation of hostilities some millions of francs properly expended, some thousands of soldiers usefully employed, seconded as they would be by the population, might easily, and in a short time, accomplish enterprises from which the country would, either in peace or war, derive important and lasting advantages."

Germany.—It is stated in a letter from Weimar, that the Prussian Government has agreed to the requisition of the Duchies of Saxe Weimar, Saxe Meiningen, and Saxe Coburg Gotha, to prolong the lines of railway which they have determined to construct across Thuringia, so as to facilitate the junction of the four cardinal points of Germany by means of railroads. The immediate effect of this determination on the part of Prussia will be the formation of a railroad which will reach from Halle, by Weimar, to Frankfort on the Maine. In Thuringia, the surveys of the lines for the proposed railways are now making.

SCIENTIFIC MEMORANDA, AND NOTES ON ART.

Adulteration of Vinegar by Mineral Acids.—The French chemist, M. Lassaigne, in his "Treaty on Re-agents," points out the best method of detecting a number of adulterations. When vinegar is suspected to be adulterated with sulphuric acid, he recommends that it should be evaporated in a porcelain capsule, until it is reduced to seven-eighths of its original weight. To the remainder, he adds about five or six times its weight of alcohol; which dissolves the sulphuric acid remaining after the acetic acid is distilled. The alcoholic solution having been filtered and diluted with distilled water, some chloride of barium is added, which precipitates the sulphate of barytes, the weight of which will determine the quantity of sulphuric acid contained in the vinegar. If the exact quantity of sulphuric acid in the vinegar is not required, the presence of that acid may be detected by merely evaporating the vinegar to dryness. Towards the end of the operation, white, thick and pungent vapor will be thrown off, which proves the presence of sulphuric acid.

Protection of Iron from Rusting, by Zinc.—M. de Althaus, director of the salt-works at Durrenberg, has succeeded in completely protecting the evaporating boilers of the salt water, which are thirty feet long, from oxidation, by fastening bands of zinc on the outside. He has observed also, that it is not necessary that the two metals should be polished at the points of contact. This fact, which he has established by more than ten years' experience, seems completely to verify the theory of contact.

The Archimedes Steam Ship.—The patentee of the Archimedes, has publicly challenged to run that ship against any paddle-wheel steamer in the kingdom, the power of which is not superior, and the tonnage and draught of water not less than the Archimedes. The trial to take place on the open sea, over a distance of 100 or 500 miles, for the sum of one thousand guineas. The 15th October inst. is mentioned as the latest day allowed for trial. Vessels worked with high-pressure engines are not to enter the lists.

Patent Water Wheel.—An experiment was lately made at Greenock, of a sixty horse power water-mill, worked by Messrs. Whitelaw and Stirrat's patent water-wheel. The advantages of this wheel had been previously proved in mills of smaller power, but it was questioned whether it would answer in those of greater dimensions. The experiment with the sixty horse power mill, seems to have fully supported the expectations of the patentees, if we may judge from the following account of the work performed, given in the *Paisley Advertiser*:—The height of fall is thirty feet, and the quantity of water used was, as nearly as may be, 13,000 cubic feet per minute. The power produced by this column of water on an overshot wheel of the best construction, would be about fifty-three horse power: there is, therefore, a balance of about seven-horse power in favor of the patent mill. But this does not show its advantages fully. In an undershot mill, where the fall is but three or four feet, the power obtained is only thirty-three per cent. In the more favorable case of a breast mill, with a fall of ten or twelve feet, about sixty per cent. is obtained, and in an overshot wheel of about thirty feet, not more than seventy per cent., under the most favorable circumstances, is obtained; while in the case of the patent mill, the gain is equal to about eighty per cent. To this may be added, that whether the quantity of water be abundant with a low fall, or scanty with a high fall, the new mill is calculated to reap alike from both all the derivable advantages. There is another point, too, wherein the patent mill has a very decided advantage over the common water-wheel. A water-wheel of thirty feet diameter makes about two revolutions per minute; hence to bring up the speed necessary for ordinary manufacturing purposes, a great deal of gearing must be made to intervene. This will frequently occasion a loss of three or four horse power—a loss which is avoided by giving a revolution of ninety to the first moving shaft, while all the expense of the intervening gearing is saved. The four most prominent advantages of the patent mill over the water-wheel, are, first, its first cost is a very great deal less; second, it produces more power with the same column of water; third, it is better adapted to every kind of fall; fourth, it adapts itself by the regulating power of its governor far more effectively to the varying work it may have to perform. Its secondary advantages are, that it is more speedily fitted up; it requires far less room, inasmuch as its pit may be floored over, and no space lost. The quantity of material being small, it admits of easy removal, and its simplicity of construction is so great, and its friction so little, as to remove almost everything like tear and wear."

Barytes Manufactory in the Isle of Arran.—The *Kilmarnock Journal* gives the following description of a manufactory of barytes, which has been recently established in one of the most beautiful parts of the Isle of Arran:—In the midst of the sublime and romantic scenery of the Glen of Sannox, Arran, and on the edge of a precipitous rivulet of the same name, has been discovered a rich vein of barytes. Last year a manufactory for the article was erected on the spot. The quarry is about a hundred yards up the rivulet, whence the ore is brought to the manufactory on a wooden railway. The ore is first washed from any mixture of earth, by means of a stream formed by some rude stones placed across a water-fall, and it is then ground into a fine pulp. It is afterwards put into square wooden frames, where it is again well washed, when it is removed to the boilers, where, being mixed with sulphuric acid, it is boiled with steam, and the ferruginous scum which arises in the process is carefully removed. It is then run off into troughs, and dried in a drying-house, kept at a high temperature, till it becomes so solid that it can be cut into an oblong brick form. It is then removed into a cooler house, where it is dried thoroughly, when it is ready for packing into barrels, or removed to the dyeing house to be dyed to any shade which may be desired. The machinery erected for the manufactory cost upwards of £3,000, and with its aid ten workmen are enabled to turn out about four tons of prepared barytes daily. This material is now extensively used instead of white lead to form the body of paints, and for many purposes is preferable.

Public Institutions for the Promotion of Science.—It has often been a question with eminent men whether such institutions as the Royal Academy and the Royal Society have or have not been conducive to the progress of the fine arts, or to that of literature and science in general. In this controversy the greater number of disputants have doubtless been in favor of those privileged bodies; but it is notorious that many very able observers and reasoners have declared unequivocally against them. One thing is clear, that, as a candidate for admission into such circles must have acquired considerable renown already, must be sufficiently wealthy to pay the attendant expense, and must be supported by a number of influential friends, it can scarcely be said that the institutions in question afford much encouragement to obscure and rising genius. As far as regards the patronage they extend to struggling merit, they are much on a par with Lord Chesterfield's *Letters* in favor of Johnson's *Dictionary*. They shed their smiles on no man until he is able to purchase and to do without them; whereas the adventitious distinction which the possession of their fellowship involves, not only loses half its value from their indiscriminate admission of opulent drones, but operates as a grievous tax upon the working bees, who, while absolutely despising their honors, cannot acquire an accredited *status* without them.—*Times.*

Mining in Derbyshire.—At the present juncture the lead mines in the Peak of Derbyshire, especially those situate at Wirksworth, Cromford, Matlock, and Winster, are in full employ, besides a great many persons are also busy in turning over hillocks of old works supposed not to have been disturbed since the Romans held sway in this island. The lead market presents the greatest activity, which is chiefly to be attributed to the heavy orders received for this article from France, there being nearly a total absence of Spanish lead. This branch of commerce is upon the advance, being now worth £21 per ton.

Copyright of Designs.—The select committee of the House of Commons, appointed to inquire into the expediency of extending copyright of designs agreed by the casting vote of the chairman (Mr. Emmerson Tennent), that it *is* expedient to extend the copyright of designs.

Messrs. Maudslay and Field's Patent.—A correspondent states that the patent taken out by Messrs. Maudslay and Field, for the combination of two cylinders to be worked by one connecting rod and valve, is not new, it having been at work in the Liverpool Docks for the last 8 or 9 years.

VARIETIES.

Steam-Boats on the Rhone.—The French Minister of Public Works has determined on the appointment of an officer at Lyons, for the special purpose of superintending the steam-boats on the Rhone.

A Frenchman's "Walk" in Liverpool.—It is extremely amusing to read the descriptions which foreigners give of what they see in England. We, by this means, frequently hear of doings and things, of which we were before perfectly unconscious. The *Moniteur Industriel* has lately been publishing a series of articles under the head "Promenade en

Angleterre," in which the people of Paris, are instructed respecting the towns, and the manners and customs of the inhabitants in most parts of England. The writer was last heard of promenading in Liverpool, of which town he says—"The sky is here clearer than in Manchester, for there are fewer cotton spinning manufactures; but there are a great many more magazins called *war-houses*, which are *usually from ten to twelve stories high*. It may be said that *half the town consists of war-houses*. It is there they store up the cargoes of the ships, two hundred of which often arrive in a single day. I saw one of these *magazins*, which contained more than ten thousand bales of cotton, on fire. Crowds of people were collected from curiosity, but not one fire-engine was at work. I asked my neighbor the cause of this? He said, that the neighboring *magazins* were not in danger, as there was no wind. "But, why not attempt to extinguish the flames in the house on fire?" I asked. "Oh! oh! said he, the building and the cotton are insured." In speaking of the number of steam-boats on the Mersey, the veracious Frenchman declares that there are always from *forty to fifty steam-boats in sight!* The steam-boats, he informs us, have always a military band on board; and he presumes, that the rival boats use this means to induce passengers to go by them. The Liverpool people will be rather surprised to find, that the Frenchman can see more of their town in a promenade, than they have been able to do in years.

The Gun Trick.—Another accident from the performance of the "gun trick," took place on Friday. "The Wizard of the North," was exhibiting at Tully's Bazaar, Gravesend, when, owing to the awkwardness of the man who fired the gun, one of the fiddlers in the orchestra was shot in the head by the wadding. The "Wizard" caught the ball between his teeth as usual; from which it must be presumed, that it had rebounded from the skull of the fiddler, who stood at a distance of six or eight feet from the conjuror, and was desperately frightened.

The *Nassau Balloon* was again in action on Thursday week. Mr. Green was accompanied by six companions, who ascended with him from Norwich. After a voyage of an hour and a half, they descended safely at Metton. We have not heard lately of the intended trip across the Atlantic in this balloon. We presume it is postponed till another year.

Joint-Stock Banking.—From the Report of a Committee of Parliament on this subject, published in 1837, it appeared that the capital embarked in Joint-Stock Banking, in England and Ireland, amounted to £11,287,120, and that the English Banks, which had commenced paying dividends, paid on the average £7 18s. per cent. This return did not include the banks established in the metropolis, and since then the capital employed in Joint-Stock Banking in the country has been very much extended, and the dividends on the average increased.

Origin of Joint-Stock Banks.—The *Newcastle Courant* says, that these institutions may date their rise from that town. "In 1822, a pamphlet was published at this office, which made the English public acquainted, for the first time, with the principle and merits of Joint-Stock Banking. In consequence of the success of this pamphlet, the author was induced to leave this town, and proceed to the metropolis, to devise the proper means for giving practical effect to his views, and by a series of efforts finally laid the foundation of this great improvement in our monetary system."

Launch of Two Ships of War.—The launch of the war steamer Polyphemus, and the ship of the line London, took place at Chatham, on Monday. The Polyphemus is intended partly to fight, and partly to transport men and munitions of war. She seems well calculated to do either. Her burden is 800 tons; her sides are sharp and almost perpendicular; and the little windows along the after-cabin will give her the appearance of carrying a second tier of guns. The London is one of the largest two-deck ships ever built. She is pierced for 92 guns, 68 and 32 pounders, but she will carry more. Her burden is 2,602 tons; she is lighted and ventilated on the war deck and the orlop deck in a manner that makes her interior more agreeable than that of any other of our ships. The figure-head of the London is a likeness of the Queen, crowned with a model of the Tower of London.

Spoiled Stamps.—The Board of Stamps and Taxes have determined, that in future their officers in the country, who allow spoiled stamps, shall be authorised to administer the affidavit, by which means all expense in regard thereto will be avoided.

Steam Navigation on South American Rivers.—A contract has been granted to a gentleman of London for the exclusive navigation of steamers up the River Amazon, and all its tributaries, for a term of 45 years. The same gentleman is in active negotiation for the establishment of a line of steam navigation between England and Brazil.

Export of Racing Horses for Russia.—On Monday week six race horses were shipped for Hamburg direct, to be added to the splendid stud of the Emperor Nicholas at St. Petersburg. At the same time 18 suits of harness, manufactured at Chesterfield, were despatched to the Russian capital for his Majesty's state carriages, &c. Training grooms, one of whom, Neale, is on the eve of setting off for St Petersburg, have been engaged by his Imperial Majesty's agents in this country.

The *population of the Netherlands*, on the 1st of January, 1840, was 2,662,189 souls, of which 1,698,342 were Protestants, 910,082 Roman Catholics, 51,127 Jews, and 2,938 of other denominations.

GRATUITOUS COPIES

of our Journal have been forwarded to a number of Individuals interested in some Patent, or Invention, of which notice has been taken in our number of to-day.

TO CORRESPONDENTS.

We shall, at all times, be ready to ANSWER QUESTIONS *that may be put to us, relative to any of the subjects indicated in our title; and questions put during the current week, will be replied to either the same, or following week.*

"THE INVENTORS' ADVOCATE, *and* JOURNAL OF INDUSTRY," *may be forwarded*, postage-free, *to all the undermentioned places:—*

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For the convenience of persons residing in REMOTE PLACES, *the* "INVENTORS' ADVOCATE," *will be regularly issued in* MONTHLY PARTS, *stitched in a handsome wrapper.* PARTS 1 *to* 15, ARE NOW READY.

ADVERTISEMENTS *should be sent in not later than* Thursday Evening.

TWO *numbers of the* "INVENTORS' ADVOCATE" *(Nos.* 48 *and* 49*) were published* July 4. *The former contains, in addition to the usual varied matter, the* TITLE PAGE *and a* COPIOUS INDEX *to the* SECOND VOLUME.

VOLUME II. *of the* "INVENTORS' ADVOCATE," *handsomely bound, is* NOW READY. *A* FEW COPIES *of the* FIRST VOLUME *still remain on hand.*

"Mr. James Malcolm Ryder, Henrietta-street, civil engineer."—*We sent the usual notice, on Saturday last, to this gentleman, informing him when the Specification of his Patent would appear. We received the following in reply:—"The next time your disinterested generosity prompts you to give advice gratis, please likewise to pay the post—Your's, &c., J. M. Ryder, C. E."—Our answer to this, is, that we have enclosed two penny postage labels to cover the expense of postage to which our Correspondent has been put.*

"E. J.," Colchester—*It will put you to considerable expense to obtain* COPIES *of the two Specifications you require. You may* read them over, *on the payment of* one shilling each.

TO INVENTORS.

ALL PERSONS who may be desirous of TAKING OUT PATENTS, or of bringing VALUABLE INVENTIONS into USE, are requested to APPLY to the PROPRIETORS of "THE INVENTORS' ADVOCATE," (DELIANSON CLARK & CO.) at their "PATENT AGENCY OFFICE FOR ALL COUNTRIES," 39, CHANCERY LANE, where they may be consulted, daily, relative to the PATENT LAWS of GREAT BRITAIN, and ALL OTHER STATES.—(See ADVERTISEMENT on the last page of the present Number.)

THE

INVENTORS' ADVOCATE,

AND

JOURNAL OF INDUSTRY.

SATURDAY, OCTOBER 3, 1840.

Another death resulting from injuries occasioned by the recent collision on the Eastern Counties railway, is reported this week. In one thing the witnesses examined at the inquest were unanimous:—that the accident was caused by the carelessness of the engineer. In direct opposition to the instructions with which he was furnished, totally regardless of the signal given by the engineer of the train in advance, on he rushed, and drove his engine directly against the carriages. For such an accident as that, none of the numerous mechanical arrangements recently suggested for the prevention of danger, would afford a remedy. The skill and conduct of the engineer alone are to be depended on, and yet the lives of all the passengers are placed in the charge of a man with whom most of them would consider it a degradation to converse, and who is thought to be amply remunerated by seven shillings a day. Care, skill, and responsibility seem to be estimated by railway directors at a very low rate; and we fear they will not learn to put a higher value on the services of those to whom they entrust the management of the locomotive engines, until they are made to suffer from the consequences of misdirected parsimony.

There have not, hitherto, that we remember, been any actions brought against railway companies, to recover damages for injuries sustained by the misconduct or neglect of their servants; but it is probable that ere long such actions will become common, and we doubt not the juries before whom those cases are brought, will testify, by the amount of compensation awarded, their sense of the necessity of increased care in making railway appointments. There have, it is true, been heavy penalties imposed, in some cases, in the form of *deodands*, by coroners' juries; but this is, after all, a senseless mode of making the parties answerable. It depends upon a fiction of the law, which supposes the Queen to sustain injury by the death of one of

her subjects; the compensation is, therefore, awarded to the Crown. In Scotland the law in this respect rests on a more rational basis. The children or relations of an individual who has been killed by the overturn of a coach, can there maintain an action against the proprietors of the conveyance, if the accident be caused by the want of care or skill on the part of their servants. This mode of proceeding meets the justice of the case, and is founded on common sense. In England, it is to the interest of the proprietors of public conveyances to kill their passengers when any accident occurs, in preference to merely inflicting personal injury. In the former case the deodand, as it goes to the Crown, is seldom more than nominal; whilst, if the injury be not fatal, the damages are usually heavy. This state of the law is so monstrous an outrage on common sense, that it might well excite our wonder that it should be tolerated in an enlightened country; but our laws generally exhibit so many instances of absurdity and injustice, that we have become accustomed to regard such perversion of justice as matters of course.

THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

The recurrence of the annual meeting of the Association for the Advancement of Science, suggests the inquiry, whether an association of this kind is calculated to answer the object it has in view, and whether it might not be made more available as the means of encouraging scientific investigations and the promotion of useful knowledge.

In some quarters, indeed, the association and its proceedings are made the objects of ridicule, as if it were totally incompatable with the pursuits of science to mingle amusement with philosophy. In this objection we can by no means concur. The days of the Stoics are passed; we have fallen upon other, and, we trust, more enlightened times; when the amount of wisdom is not measured by the extent of abstinence from human enjoyment, and when science is not the less esteemed because it increases the conveniences and pleasures of life. The disputes of the Schoolmen might sharpen the intellect, but they led to no practical result. It was not until men directed their attention beyond the abstract speculations of their own minds to the operations of nature, that any advantage was gained by philosophical studies. An ascetic is no longer, *ex officio*, a philosopher. To obtain that character he must act as well as think. The value of researches, of discoveries, and of inventions, is not diminished because the philosopher joins his fellow mortals in their rational enjoyments, and contributes to amuse as well as to instruct mankind. We place no weight, therefore, on the objection taken to the British Association, on the ground that science would sustain injury by the exhibition of its professors, at the annual meetings, in the ordinary occupations of life.

Another objection has been raised to the very principles on which the association is founded, which is still less tenable. It is contended, that the "smattering" of science gained at these perambulatory meetings of the association is calculated to do harm; that it is better to have no knowledge at all, than a superficial knowledge, acquired rather as an agreeable pastime than by severe study. In our opinion the most important object to be gained by the British Association, is to spread the seed of knowledge in different parts of the kingdom, and to excite a spirit of inquiry, and a desire to know more of the causes of natural phenomena. It is rather by the extension of knowledge than by its profundity that society is benefited. Any degree of knowledge is better than none, especially of the works of nature, for that, in whatever quantity it is possessed, is sure to add to the harmless enjoyments of life, even should it have no other result. If, indeed, "superficial knowledge" is to be denounced, who is there bold enough to affirm that his scientific penetration removes him from that category? It is merely a question of degree; for our profoundest philosophers, after all their labor and study, possess only a "superficial knowledge" of the works of the Great Artificer.

An attempt is often made to disparage the experimental philosopher in comparison with the abstract mathematical reasoner; but if their respective claims are to be tested, either by the benefits they have conferred on mankind, or by their contributions to scientific knowledge, the mathematical reasoners may "hide their diminished heads." What they have done, except in the province of astronomy, amounts to nothing; even the attraction of gravitation, on which the motions of the heavenly bodies depend, owed its discovery not to mathematical reasoning, but to the observance of an accidental occurrence. All the great discoveries in science owe their origin to observing and reflecting on practical phenomena, and it is by extending the application of such observations that we must principally rely for the further progress of scientific truth, and for improvements in the arts and manufactures of the country.

Considering, therefore, that one great object to be aimed at by the British Association is to diffuse existing knowledge and to stimulate inquiry, we wish that its efforts were more directed to those objects, than to the elucidation of particular theories, or the determination of isolated questions, which have little general bearing on the field of scientific knowledge, nor are capable of useful practical application. Many of the papers read at the recent meeting at Glasgow are, indeed, on subjects of much interest, and the objects for which grants from the funds of the Association have been sanctioned are proper matters for inquiry. But we object to the want of unity of purpose which pervades the whole proceedings of the Association. There is too much of piece-meal disquisition and investigation. The papers on all subjects, without order, are collected and printed, and a few hundred copies are perhaps disposed of; but, so far as the public at large are concerned, were it not for the brief reports in the newspapers, they would remain in utter ignorance of the doings of the Association. The voluminous mass of their "transactions" is even less extensively known than the exclusive transactions of the Royal Society; and when collected they present a heterogeneous agglomeration, formed apparently without any design. It appears to us that the committee of management would much more effectually promote the objects of the Association were they to apply the funds at their command to carry out some uniform and combined plan, instead of frittering away their means in prosecuting unconnected inquiries. Some mode of generalising the different detached facts should, at all events, be adopted; so as to show the bearing they have upon those branches of science which they illustrate, and to point out those subjects which are new, or are placed in a new light.

It would, indeed, be advisable for the Association to devote a portion of its funds for the compilation of a comprehensive work of science, to be published with the authority of the committee, which might serve as a groundwork for all their future proceedings and publications. We should thus possess a standard work comprising all branches of science; and at the close of each year, a supplement condensing in a short compass the substance of the papers read at the meeting, with their reference to the original work, would afford a sufficient and valuable index to the more extended investigations given in the transactions at length.

NEW INVENTIONS.

NEW MODE OF PREPARING INDIGO IN FRANCE.

Three important memoirs on this subject have obtained prizes of 1,000 frs., 500 frs., and 100 frs., from the Society of Pharmacy, at Paris. The produce of indigo, by the former processes of preparing it in the colonies, is about one and a half in each hundred of green leaves; and according to some accounts much less. But the quality and value of the produce are in inverse proportion to the quantity obtained, on account of the number of heterogeneous substances which are mixed with it; and the smaller quantity, when pure, yields more coloring matter than the larger quantity. The substitution of hydrochloric acid for sulphuric acid, is the principal improvement introduced in the new process of manufacture. The leaves are steeped in three times their weight of water, at a temperature of only 30 deg. centigrade (86 deg. Fahrenheit). The infusion is allowed to remain until it becomes green, and the surface is covered with a colored layer. It is then decanted, and one and a half per cent. of hydrochloric acid is added. In two minutes, during which time certain extraneous substances begin to be precipitated, and before the indigo can be deposited from the liquor, it is strained through a cloth, which cleanses it from impurities, whilst it permits the indigo to pass in a state of solution. The filtered liquor should

be well shaken for a quarter of an hour, for the purpose of oxygenising the whole; it is then permitted to remain until it settles. When the indigo has been precipitated, it ought to be mixed up with water slightly alkaline, and dried. It then forms a beautiful color, excessively light, whilst that obtained by other processes is heavy and of inferior quality, owing to the mixture of other matters. M. Osmin Harvy, to whom the highest prize was awarded, employs a higher temperature. He precipitates the indigo by four grammes (about 62 grains) of lime for every hundred leaves, agitates the liquor well, and, lastly, extracts the lime from the indigo after it is deposited. The process employed in the colonies is, to precipitate the indigo by beating the liquor when it is in a state of fermentation, and then to add lime water.

A NEW WATER-WHEEL.

An interesting experiment took place, a few days ago, in the Seine, opposite the water-works at Chaillot. A wheel of a new invention, entirely submerged, so as to be exempt from the action of ice, and independent of the increase or decrease of the bed of the river, is, by the force of the current, able to raise water to the height of 70 feet. The wheel tried in the Seine is only a yard in diameter, but it raised a volume of water estimated at one cubic inch per second to the height above named. In the Rhone, where the current is very rapid, the volume would be nine inches.

PATENT METALLIC ROPES.

We have been favored by Mr. Gordon, Professor of Civil Engineering in the University of Glasgow, with the following account of an invention lately introduced into this country, which promises to be extensively useful in mines and upon railways, and in fact wherever ropes of great length and strength are required for engineering purposes.

The manufacture of ropes from metallic wire is a German invention. The first experiments on which it was founded were made as long since as the year 1827, but it was not till some years afterwards that a rope was produced which fully answered the ends desired. Several improvements were discovered in the method of manufacture, and about seven or eight years ago the invention was applied to the purpose of drawing minerals in shafts and on inclined planes, in the mines of the Hartz mountains and near Bonn, and elsewhere in Germany, with perfect success; and the metallic wire ropes are now almost universally used throughout the mining districts of Germany. Accounts of these ropes have been given at various times in the different scientific journals of that country; and the writer had an opportunity, during a residence there of several years, of making himself practically acquainted with their operation and with the method of making them, and he is able to speak in the strongest terms of their utility.

Messrs. R. S. Newall and Co., of Dundee, have lately taken out patents in this country for a new metallic rope, which is an improvement upon the very best kinds used in Germany, and for a new machinery of their own invention for manufacturing them with the utmost expedition, cheapness, and accuracy. These ropes have many advantages over the common hempen rope, being at once safer, lighter, more durable, and cheaper. They are little liable to any flaw, as it is hardly possible for many unsound parts in the wires of which they are formed to come opposite each other in the same part of the rope, and as every single wire is open to sight, it is easily seen where the ropes have become so much worn as to be unsafe. Ropes often fail without any visible cause, as is well known to all persons engaged in the working of mines.

For the work required on those railways where the draught is performed by ropes (which is the case on the London and Birmingham Railway between Euston-square and Camden-town, and along the whole line of the Blackwall Railway), the metallic rope is peculiarly suitable; for there the great *desideratum* is to have a rope as light as possible consistently with the necessary degree of strength. The strain on the Blackwall rope, from its own weight alone, is believed to be nearly one-half of the whole strain for which the power of the stationary engines is calculated; in other words, half the steam power is required to move the rope and machinery itself; and yet the rope, though of such a weight, appears to be of a strength hardly sufficient for perfect safety. A metallic wire rope of much less weight would nevertheless be very far stronger.—*Times.*

NEW GUN CARRIAGE.

A stupendous carriage for the long gun in St. James's Park, constructed in the carriage department, has just been cast by Messrs. Hall, of Dartford. It is divided into five compartments. The first contains the insignia of the Order of the Garter, the second is filled up with a shield and crown, with the initials G. R. III. in the shield. In the central compartment, Britannia is represented seated, with a shield at one side, and a lion couchant at the other. The perspective is filled up with a view of the ocean, and the Pyramids of Egypt in the distance. The fourth department contains an enormous crocodile, the "slimy monster" of the Nile. The fifth contains the emblems of oriental (or rather, we should say, oriental and occidental) personification—the sabre and the sceptre crossed, and the coronet of feathers, which, to our minds, is associated only with the ideal figure of America. The reverse of the carriage is precisely similar; at the end is this inscription:—"This gun taken in Egypt by the British Army, 1801." The wheels, which are placed upon a separate truck, are exceedingly massive; the radii are shaped like the branches of the palm tree. A sphinx lies on the same carriage intended to lay at the foot of the gun. The weight of the carriage alone is seven tons, eight hundred weight, two quarters, and seven pounds. Those who are acquainted with works of this description consider it an excellent production. We consider the design, however, devoid of that freedom which in the present state of art might easily be attained. —*Woolwich Gazette.*

REPORTS OF SCIENTIFIC MEETINGS.

BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

(*Continued from last week.*)

The general meeting of the Association was held on Thursday evening. The Marquis of Breadalbane presided, and the general address was read by M. Murchison, the substance of which was given last week.

PROCEEDINGS OF FRIDAY, SEPT. 18.

SECTION A.

1. Sir David Brewster. Report on Meteorological Observations at Kingussie and Inverness.
2. Mr. Osler. Comparative Force of Wind during the twenty-four hours.
3. Mr. Caldicott. Hourly Meteorological Observations at Trevandrum.
4. Sir David Brewster, on a Blue Sun at Barbadoes.
5. Mr. John S. Russell. Report on Waves.
6. Professor Kelland, on Mathematical Theory of Waves.
7. Mr. Peebles, on Expressibility of Roots of Equations.
8. Sir David Brewster, on Professor Powell's Measure of the Refrangibility of the lines G and H in the Spectrum.
9. Professor Powell, on a case of Interference.

Whilst the diagrams for illustrating Sir D. Brewster's report and Mr. Osler's communication were being arranged—

Sir D. Brewster proceeded with the account of a blue sun at Bermuda. The communication had been made to him by Col. Reid, the present Lieut. Governor of Bermuda, and the well-known author of the able work on the Laws of Storms. The colonel, in his letter of August 17, 1839, relates the singular blue appearance of objects under certain conditions of the atmosphere, a fact familiar to all in Bermuda, and seeks explanation of the phenomenon. In 1831 it occurred most remarkably, as was described by the present collector of customs at Bermuda, who witnessed it. According to Mr. Hardy's account, one morning at sea, fifteen miles east of Bermuda, the day being tranquil, the pure white sails and every object in the vessel appeared of a blue color, whilst the sea itself was deep yellow, and was observed to be of that hue even to the coast of America. He was not aware that this phenomenon had ever been accounted for. It appears whenever halos are formed, but in this country the generally blue color is not observed. It is produced, he said, in a way analogous to the colors of mixed plates, which are caused by the fringes of the rays of light or portions of light of different degrees of refrangibility.

Professor Forbes observed that the explanation given by Sir D. Brewster, which he thought well founded, had already been suggested by Professor Babinet, namely, that vapors of different densities collecting in the atmosphere constructed a medium which caused interference and produced color.

Sir D. Brewster submitted an abstract of the report No. 1. Of this a brief statement had been given at Birmingham: he now submitted the observations themselves, contained in two quarto volumes. From the results of these observations, showing the annual mean of the several meteorological phenomena laid down in curves, and by comparison thereof with similar reductions of observations made, and making at Leith, Plymouth, Padua, Philadelphia, &c., Sir D. Brewster thought he detected traces of meteorological laws, which, when more fully developed, would lead to a knowledge of the phenomena of planetary action.

Mr. Osler then explained, in the first instance, his mode of tabulating the results of the registries of his anemometer. The diagrams were most elaborate, simple, and beautiful. It appears that an increase of temperature always precedes a rise of wind, and that there is a probability of the prevalence of certain winds at certain hours. The number of observations, however, as yet was only 26,000, which, apparently large, when divided by four for the seasons, and by sixteen for points of the compass, give only seventeen for each hour, which are not enough for accurate deduction.

Mr. J. S. Russell's report was considered, in which the peculiarities of the tidal waves in the Firth of Forth were discussed. The suggestion given by him at Birmingham last year to explain the phenomena of four high and four low waters occurring in the Forth during the twenty-four hours had been confirmed. The great tidal wave of the Atlantic ocean splits into two, the one passing up the English Channel, and the other round the Orkneys to the east coast and the German ocean. When the recurrence of these two tidal waves coincide, one high water only is the result; but when they do not coincide in point of time, the peculiarities of the Forth occur. Then the channel tide wave arrives before the northern one, and passing on through a shallow channel, which causes the singular appearance in the wave designated the hump. The other arrives at a certain interval to a fuller channel, and is not so retarded as the former one, which it overtakes, and with which it coincides at Stirling, where only the ordinary high and low waters occur. This was explained and borne out by the fact of the velocity of a wave having a certain relation to its depth, &c. The mechanical structure of the wave was also determined. The views entertained and practically arrived at by Mr. Russell, have been, to a considerable extent, theoretically deduced and mathematically proved by Professor Kelland, as appeared by his paper, but which, as well as the

following in the list, were too abstruse for popular report.

SECTION B.

1. Professor Thomson, on Chemical Manufactures of Glasgow.
2. Mr. Connell's Additional Observations on the Voltaic Decomposition of Alcohol.
3. Professor Graham's Notice of the New Chemical Views of Professor Liebig, on Agriculture and Physiology.
4. D. R. W. Glover, on a New Process for obtaining Hydrobromic Acid and Hydriodic Acid.
5. Professor Bunsen, on the Compounds of a New Radical called Kakodyl.
6. Dr. Mohr, on a New Mode of preparing Morphia.
7. Mr. Sturgeon, on a Peculiar Class of Voltaic Phenomena.

Before the regular business commenced, the muroxide produced by Dr. Gregory in his experiment yesterday, was handed round the room for the examination of the section.

Professor Graham was then requested to take the chair, while the president, Dr. Thompson, read his paper. The manufacture of iron, sulphuric acid, bleaching powder, or chloride of lime, alum, precipitate of potash, achromate of potash, tartaric acid, acetic acid, pyroxalic spirit, iodine, soap, bleaching of cotton cloth, Turkey red dying, glass making, cudbear, and gas, were enumerated, and the several operations and processes fully explained. It contained a mass of valuable information of vast local and indeed great general importance.

It is much to be regretted that of the whole of the above enumerated factories, and many others here and in the neighborhood, not one has been thrown open to the inspection of the members of the association. Application was made, but permission refused; and the bright example of Birmingham, Newcastle, &c. neglected.

The second paper read was by Mr. Connell, "On the Voltaic Decomposition of Alcohol." The author endeavored to show that, by dissolving a small quantity of potassium in pure alcohol, and then subjecting the compound to voltaic action, water was obtained,

Dr. L. Playfair read the next paper, which was by D. R. W. Glover, "On a new process for obtaining hydrobromic acid and hydriodic acid." The author proposed the employment of bromite and iodite of bromine as a very convenient source of the above named hydrobromic, in atomic proportions.

Professor Bunsem read the next paper, which was on the compounds of a new radical compound, called "Kakodyle." The process by which this compound is obtained is exceedingly dangerous, and the author, in his experiments, has been several times severely injured. Arsenic is a principal ingredient in the compound.

The next paper read was by Dr. Mohr, on a new mode of preparing morphia. The principle of the new method of preparing morphia consists in dissolving the morphium in caustic lime by means of heat, and precipitating the filtered liquor by muriate of ammonia. The lime is neutralised by the muriatic acid of salt, ammonia set free, and the morphia precipitated. In this process the morphia is obtained in a crystalline and very pure state, without the alcohol. This mode of operating is as follows:—The opium is dissolved in boiling water and strained, this operation repeated twice, the liquors concentrated by evaporation, boiled with caustic lime, strained again, and mixed while hot with powder of sal ammoniac.

Dr. R. D. Thompson read a paper by Mr. Sturgeon—"On a peculiar class of Voltaic Phenomena." The Section then adjourned.

SECTION C.

1. Professor Johnson on Chemical Geology.
2. C. Lyell, Esq., on Ancient Sea Cliffs, and Needles of Chalk, in the Valley of the Seine, in Normandy.
3. A. Ramsay, Esq., on the Geology of Arran.
4. W. Keir, Esq., on the Geology of Castle-hill, Ardrossan.
5. J. Craig, Esq., on Coal Formation of the West of Scotland.
6. W. Sanders, Esq., on a Raised Beach at Woodspring-hill.

Professor Johnston stated the substance of the paper he had given in, on the subject of chemical geology. He confined himself to the consideration of the coal formation. He took it for granted that coal is derived from vegetable substances, and proceeded to consider the character and action of the agents at work in the process of its formation. He discarded the names employed by some geologists to describe the different characters of coal, such as caking, bituminous, &c., and as carbon, hydrogen, and oxygen are the components of all vegetable matter, he proposed to describe the various characters of coal by a chemical mode of notation, indicating the relative proportions of these qualities in coal. Thus, the Newcastle caking coal, and anthracite Welsh coal, were described as follows:—

	Newcastle coal.	Welsh coal.
Carbon	89·19	94·05
Hydrogen	5·00	33·38
Oxygen	5·81	2·57
	·100	·100

He went on to show that it is the peculiar province of chemistry to inquire into the means by which coal is produced from vegetable matter. He then described the process of decomposition which takes place under the united influence of water and atmospheric air. Different kinds of coal, he showed, were not derived from different kinds of wood or vegetable matter; but, in reality, all of them were steps in the descent from highly organised matter to a state, as in the anthracites, where organic structure altogether disappears. Coal was therefore derived from vegetable matter, in obedience to a general law. The learned professor, in concluding, referred to the arguments against the opinion that the wood of the coal formation was drifted in water to the places where they were deposited. The evidence on this point, he confessed, inclined him to the belief that the trees had grown on the spot. One argument was this—some of the coal of the Newcastle fields, for instance, was found so pure as to contain not more than one half per cent. of silt or foreign matter; how, then, could masses of wood be transported to their present beds without a very great mixture of clay or sand? Another argument was, that over a large area the coal was only one inch thick. In other cases there were different kinds of coal overlaying one another in alternate layers, but so different in quality, that the miners could dispose of the whole of one seam as fast as they could work it, whereas the next seam might not be worth disposing of at all. In other cases there was observable a regular stratification. All these arguments were urged by intelligent miners against the theory which assigned the coal formation to drifted trees. Without giving any positive opinion on this point of the subject, he would merely say, that on a weighing of the evidence on both sides, he thought the balance was in favor of the idea that the vegetable matter grew upon the spot.

Dr. Buckland held the views propounded by Professor Johnston to amount almost to a demonstration, and regarded them as an epoch in the investigation of the origin of coal. The argument against drifted trees might be true as far as it went; but it was not true altogether. He believed that other beds of coal were the result of vegetable matter drifted from great distances. Instances of this kind were clearly proved by the pine found in Craigleith quarry, and other fossil trees imbedded in sand, and completely cut off from the ground below. The truth probably lay between extreme views on both sides.

The foregoing was the most interesting paper read this day in the geological section.

SECTION D.

1. Sir John Dalzell on the Loss and Regeneration of Organs discharging the functions of the Head and Viscera, by the Holothuria and Amphitrite, with drawings.
2. Mr. James Wilson on Insects from Persia.
3. Dr. Aldridge on the Pollen of Plants.
4. Mr. Babington. Notice of Cuscuta epilinum.

Report of the Committee on Radiate Animals.

Report of the Dredging Committee.

Mr. Forbes, in bringing up the Report of the Committee for investigating the Marine Fauna of Britain, by means of the dredge, said that in consequence of the badness of the weather, and other causes, they had been enabled to expend but a portion of the grant, with, however, most interesting results. A series of dredgings had been conducted on the west coast of Ireland by Mr. Thompson, Mr. Bull, and Mr. Forbes; in the neighborhood of Belfast by Mr. Patterson; and on the coasts of the Isle of Man by Mr. Forbes. The results had been carefully noted down in papers prepared by the direction of the Committee, the number of species and their associations, the comparative numbers of living and dead specimens, the ground, depth, locality, and region, all being recorded. On the west coast of Ireland, the testaun usually regarded as characteristic of the southern districts in Britain, and on the east coast, are found exteoding their range far to the north. One district, that of Connemara, presented an exception, agreeing in the characters of its fanna with the lochs of the Highlands of Scotland. The species of testaum observed were very generally distributed; those in the region of Laminaræ were generally in the same region on the east coast, but such as inhabited the region of corallines were more southern in character. The sandy tracts examined were very scanty in specimens; muddy bottoms abounded in bivalve, mollusca, and the gravelly in univalves. Scallop and oyster banks were not met with; indeed, no instance of a true shell-bank was observed. Dead shells were generally more abundant than living.

The other papers read, were not of a nature that would prove generally interesting to our readers.

SECTION E.

1. Dr. Alison on certain Inferences which may be drawn from the study of the Nerves of the Eye-ball.
2. Dr. Newbigging on the Therapeutic Effects of Croton Oil in certain Nervous Diseases.
3. Dr. Lawrie on the Results of Amputation.
4. Dr. Reid on Blood-vessels of Mother of Fetus (Human).
5. Dr. Glover on Effects of Bromine, and its Compounds.
6. Dr. Thomson on Opacity of Cornea produced by Sulphuric Acid.
7. Dr. Reid on Medulla Oblongata.

SECTION F.

1. Dr. Chalmers. On the Application of Statistics to Moral and Economical Questions.
2. Dr. Cowan. On the Vital Statistics of Glasgow, illustrating the Sanatory Condition of the Population, with Suggestions for its Improvement.
3. Dr. Alison. Illustrations of the Practical Operation of the Scottish System of the Management of the Poor.

The greatest interest prevailed to hear the paper of Dr. Chalmers. The section room was not sufficiently large to contain the numbers applying for admission, and an adjournment consequently took place to the college-church. The subject of statistics not, however, being within the immediate scope of the objects of the Association, we shall forbear at present at least from taking a further notice of the papers read.

SECTION G.

1. Wallace. Smoke Protector.
2. Hawkins. (Model) Bakewell's Angle Meter.
3. Rayner. (Model) Machine Regulator.
4. Smith. (Model) Canal Lockage.
5. Fairbairn. Iron as a material for Shipbuilding.

6. Hodgkinson. Strength of Pillars.
7. Fairbairn. Raising Water from Low Lands.
8. Hodgkinson. Clegg's Safety Lamp.
9. Rev. J. Brodie. Uniform Propelling Wheel.
10. Dunn. (Model) Improved Working Barrel.
11. Dr. Farquharson. Sea-borne Vessels.
12. Evans. Anthracite Pig Iron.

Mr. Wallace exhibited and explained his apparatus for enabling persons to enter places on fire without danger from smoke, by means of breathing through water. A box of tin containing the water is placed on the man's back with tubes connected, forming a ring round the body and straps for the shoulders. A hood of Macintosh cloth glazed in front is put on the head, and being attached to the side tubes, four gallons of water will enable a person to bear the densest smoke for twenty minutes.

Mr. Smith, of Deanston, exhibited a model of a new plan of canal lockage, the advantages of which he stated to be that the descent in each lock would not be more than 12 to 18 inches—that the locks were opened by the passage of the vessels—that the locks shut of themselves—that the vessels did not require to stop—and that little or no water was lost. The lock gate is hinged at the bottom, the upper portion which is round floats at the level of the higher part of the water, and is pressed down by the bow of the vessel in passing, and when it is passed rises to its former position. A long conversation took place on the subject, during which the highest opinion was given of the value of the invention to canal navigation.

Mr. Fairbairn read a paper on the strength of iron, with a view to test its applicability to the purpose of ship-building.

Mr. Hodgkinson then read a paper relative to a series of similar experiments made by him on the strength of iron pillars. It appeared from these that a pillar square at top and bottom, was about three times as strong as one rounded at the ends—that if the pillars were not placed perfectly perpendicular at least two-thirds of their strength was lost—and that they were one-seventh stronger when swelled in the middle like the frustrum of a cone, with the base in the centre of the pillar. A short conversation ensued, in the course of which Professor Wallace suggested that Mr. H. should try the experiment with various curves, which that gentleman readily promised to do.

Mr. Fairbairn next exhibited a model of an engine for raising water, which he had suggested for the purpose of draining the lake of Haarlem, in Holland, which covered upwards of 50,000 acres. It was his opinion that this could be accomplished by the application of a Cornish engine, of from 200 to 300 horse power, attached to a scoop 30 feet square, the one end of which was made to move on a centre. In the bottom of this scoop, which was curved, were several valves opening upwards, on the side nearest the engine. By the descending stroke of the engine, this side was immersed in water, and filled through the valves. The returning stroke, or rather the weights attached to the other end of the beam, raised the scoop and threw the water into a canal at a higher level than the lake. Such an engine as he proposed would lift 17 tons of water each stroke, and make seven or eight strokes a minute. The average depth of the lake was 10 feet. The engine was so constructed as to give the dipping end of the scoop a larger or shorter stroke as required.

A member gave a short account of the mode adopted in draining some of the fens in England, which was done by an engine on Watt's principle, turning a kind of bucket wheel, and raising the water into the adjoining river. This gave rise to a long but inconclusive conversation on the comparative merits of these modes of draining.

Mr. Hodgkinson produced a miner's lamp by a Mr. Clegg, near Oldham. It was in principle the same as that of Davy, but was inclosed in a triangular lantern with three bull's-eye glasses. The object was to get rid of the danger arising from the use of Davy's, which, should it fall or upset, let the flame through the wires and caused an explosion. In this lamp that danger was obviated, as there was gauze on the air-hole of the lanterns; and it had this excellent property, that whenever there was danger the light went out. The model was highly approved of.

The promenade in the evening was very crowded, although the Exchange affords capacious accommodation.

Saturday's Proceedings.

Section B.—*Chemistry and Mineralogy.*

Dr. L. Playfair read the first paper, which was by Dr. Schafheutl, "On the new mode of Photogenic Drawing." The author described the method of preparing the paper, taking the impression, and fixing the tins, and concluded by showing the difference between his system and the one most generally practised. He afterwards practically exhibited the mode in which he proceeded.

Sir David Brewster read a very interesting paper upon the decomposition of glass. He had formerly brought the subject before the Association; and since that time he had got two specimens of glass—one from Italy, and the other from St. Andrew's—of which the character had been entirely changed by decomposition. Sir David then described the mode of decomposition. It began at certain points, and extended over the surface, either in planes, or in concentric films, affording colors of surpassing beauty. In one of the specimens, the silicious portions had separated from the metallic, and had arranged themselves in alternate circles around the first point of decomposition. This liability to decomposition Sir D. feared might produce serious results to science, as some of the finest glasses of scientific instruments were exhibiting symptoms of decay.—Professor Forbes thought the softness of the glass used was more the cause of decomposition than atmospherical influence.—Sir David then described several curious effects produced by the polarisation of light by decomposed glass.

Professor Phillips gave an account of a number of experiments made by him on the subject of rain gauges. To determine the difference between gauges at higher and lower altitudes he placed one gauge on the ground, and completely exposed others at heights of 3, 6, and 12 feet, and, after a trial of four months, he had found the results to be in the following proportions—the highest 8,206; the next 8,249; the next 8,314; and the lowest 8,408; thus showing the greatest quantity of rain to have fallen nearest the ground.

Mr. Espy then began his paper on the Theory of Storms, which occupied nearly two hours. His theory is, that, during storms, the wind blew from all sides towards a centre, whether the centre of a circle or a square. He went into a great many instances of storms which had happened at particular seasons, and, from facts ascertained as to the direction of the winds at various places around the space in which the storm prevailed, he showed that the facts confirmed his theory. The principles upon which it is founded are nearly the following:—The equilibrium of the air may become unstable by the heat or the moisture below. Ascending columns or currents of air are thus formed, which, as they ascend, are subject to less pressure and expand. This expansion produces 1¼ deg. of cold for every hundred yards of ascent, while the dew point falls only ¼ deg. for the same space. Clouds will begin to be formed when the column of air rises, as many hundreds of yards as the dew point is below the air in degrees. When the vapor condenses, it will give out the latent caloric into the air, which will prevent the ascending air from cooling more than half as much as it would otherwise have done on its further ascent. Thus, the higher the column of air rises, the warmer it will be when compared with the air on the outside of the cloud at the same height. For every degree that the cloud is warmer, it will be a certain amount lighter than air at zero, and thus under the cloud the barometer will fall, and the air will run in under the cloud and upwards with a velocity of upwards of 240 feet per second. After a long account of his theory of the formation of clouds, Mr. E. gave a description of the effects of the tornado, which he held to be additional evidence in favor of his theory.

Section E.—*Medicine.*

Dr. R. Thomson read a paper on the action of sulphuric acid on the cornea of the eye. He showed by experiment, that the acid, if in contact with the eye for two minutes, produced a coagulum by combining with the superficial layer, by acting on the albumen. He suggested the possibility of removing this membrane by an operation.

Section C.—*Geology and Geography.*

G. B. Greenough, Esq. in the Chair.

Dr. Hamilton read a paper "on recent Earthquakes in Peru," from which the following is an extract:—

When the atmosphere became clear, the Andes, as seen from Tacna, presented a novel spectacle; those mountains, in many parts, appeard with a new surface; large portions had been thrown off, and slid down into valleys or ravines below, leaving some of the more elevated peaks denuded of what had been their more prominent limbs; also large masses of snow were detached from some of the higher pinnacles.

Within the last few years, an important subterranean change seems to have happened below that portion of the earth's surface which we have been considering.

From time immemorial, every shock of earthquake there was preceded by a subterranean noise; but since the great earthquake of 8th October, 1831 this warning has been seldom if ever heard; formerly the people had time to run from the houses to some open place, between the commencement of of the noise and the shock.

This subterranean noise was not unlike that of thunder, as it is heard when rolling among the valleys of the Andes far below places where the traveller has to traverse those sublime heights.

Geological Trip to Arran.

On Saturday morning, according to previous arrangement, eighty-four gentlemen, including many of the leading geologists, and some of the other distinguished members of the British Association, proceeded by railway to Ardrossan, whence they were conveyed over to Arran by the steamers on the station. They were most hospitably received by the Marquis of Douglas at Brodick Castle.

At six o'clock in the morning, a party of about a hundred gentlemen sailed for the same destination in the Flambeau steamer, which was placed at their disposal for the day by the proprietors.

A separate party sailed by the Sir William Wallace steamer, but we confine ourselves to the proceedings of the Flambeau party.

As they passed down the river, it was agreed that some of the gentlemen present should describe the geological features of this or any other district they were acquainted with, and accordingly geological lectures and conversations occupied the party throughout the voyage. On passing the Kilpatrick hills, where the peculiar beauties of the Vale of Clyde begin to appear, Mr. Craig gave a short detail of the nature of the formation that skirts that range, and which is to be considered as belonging to the regular carbonaceous series of the district. He alluded to certain beds of conglomerate, seen extending from Muirhouse, near Edinbarnet, to Craigmaddie and Strathblane.—Dr. Nichol next called attention to the peculiar characteristics of the island of Arran.—Dr. Crooks explained the geological map of England.—Dr. M'Donald described some of the features in the primary rocks of Argyleshire and the northern parts of the Isle of Bute.

The Flambeau pasty approached the island near the detached sandstone block called the Cock, at the western extremity, and, sailing southward along the shore, had an opportunity of seeing the

series of the coal measure. They observed the profuse variety of the secondary strata that succeed southward till they reach Corry. Here they landed at a fine natural harbour; and, armed, the geologists with hammers and bags, the botanists with vasculums, and a few of both arrayed in nondescript costume, sallied forth, to the no small astonishment of the natives, in quest of their respective objects of research. The first point of interest was the great lime quarry of Corry, where all who chose collected specimens of the Terebratulae and producti, which abound here in enormous quantities resting in beds, resembling those of oysters, in the position they must have occupied when upheaved from the sea; and of the madreporites which occur in smaller quantities. Here the party divided; about 80 commencing the ascent of the lofty Goatfell, the remainder penetrating Glen Sannox. The surprise and delight of the strangers were boundless when they attained the summit, and found themselves as it were upon the edge of a crater of some Polynesian volcano, alike overwhelming by the vast dimensions of its circumference, its alpine altitude, and the yawning and seemingly fathomless profound in the gorges and valleys below.

The divided parties were re-united at Brodick harbour, and the botanists and geologists having, by common consent, agreed to merge themselves into one great Gastronomical Section, the vessel took the route to Glasgow, while they discussed the substantial business of the meeting. The Flambeau reached the Broomielaw at 11 o'clock.

Monday's Proceedings.

Section A.—*Mathematics and Physics.*

Two papers were read by the Secretary, being reports by Sir J. Herschel, on the Nomenclature of Stars, and on the reduction of Meteorological Observations. Then followed a long and learned dissertation by Mr. Kennedy, on the Laws of Electrical Phenomena; but as the illustrations were purely mathematical, they would neither be intelligible nor instructive to the general reader. Sir D. Brewster, at the request of the Chairman, exhibited and explained the Daguerrotype. A paper by Mr. Fox was read by professor Forbes, on Subterranean Temperament, which was followed by papers by Mr. Hodgkinson and Professor Forbes, on the same subject. The only popular paper in this Section was one by Dr. Reid, on what he has denominated the Iriscope. The experiments exhibited were two. A solution of Castile soap in water, is put into a bottle to about half the depth, which, when shaken, leaves a soap "bubble" across the diameter of the vessel. This film or bubble exhibits "all the colors in nature." The other was exhibited by coating a piece of plate glass with a solution of Castile soap in water, which, after being dried, was polished. This being breathed upon through a glass tube, instantly produced all the colors of the Iris, in a circle surrounded by a dense black ring.

Section B.—*Chemistry and Mineralogy.*

The first paper read was by Mr. Mallet, on the action of salt and fresh water on cast and wrought iron and steel. The author read a similar paper to the Mechanical Section on Saturday, it is not necessary, therefore, to give any detailed notice of the paper in this Section.

The next paper read was by Mr. Griffin, on a "New Mode of Crystallographic Notation." The author proposes to divide crystals into seven classes as exhibited by the essential mathematical forms of all crystals.

The next paper read was by Professor Johnston, "On the Resin of Sarcocolla." The constitution of the resin, the author explained, by the result of a number of experiments, had shown that this substance, instead of consisting of a substance like sugar, consisted of four other substances—a gum insoluble in water—a gum soluble in water, but insoluble in alcohol—a third capable of being dissolved in alcohol, and a fourth capable of being dissolved in alcohol or ether.

Section C.—*Geology.*

Mr. Murchison, the General Secretary, gave a brief statement of the results of his geological tour in Russia, and in the presence of General Tscheffkine bore testimony to the uniform attention that had been paid to him by the Russian authorities. After some introductory remarks as to our limited knowledge in this country of the geology of Russia, and the obvious difficulty of investigating it, in consequence of its almost unbroken flatness, and of the vast quantities of drift sand, boulders, and detritus, spread over it, to an extent which had led geologists hitherto to believe it futile to attempt the investigation of so impracticable a field, as one where there was nothing but sand, no rocks in situ, and none of those features which elsewhere placed geology in the clearest light,—from a sectional outline of his investigations, Mr. Murchison proceeded to show that, beginning at the point NNW. the oldest sedimentary deposit of Russia is the Silurian, forming the lower shale or clay on which St. Petersburg is built, and containing no organic remains. The Silurian is succeeded by the sandstone, in which are found several fossils overlaid by limestone containing ammonites, trilobites, belemnites, and other types of the Silurian system. Mr. Murchison proceeded to give his reasons for believing the sandstone that succeeds the Silurian formation (the latter being the oldest rock he discovered), to be the same as the old red sandstone of the British islands, the Devonian system of Professor Sedgwick and himself. It consists of flaggy limestones, marls, some beds of which are extremely fossiliferous, and contains fossil which also occur in Belgium and Devonshire. In these same beds are associated some of the fishes and fish scales which had been described by M. Agassiz (who was present), and by himself. These deposits are of vast dimensions, and beautiful sections may be seen on the Waldai hills, half-way between St. Petersburg and Moscow. Next in the ascending order, is the carboniferous system, the lower beds consisting of yellow sand, mixed with bituminous shale and coal plants. He next described the white limestone and oolite succeeding to the former, and pointed out a beautiful specimen with the productus antiquatus embedded in it. This limestone ranges for not less than 1000 English miles, so far as he could judge, without a single break; for none of these deposits are broken and tilted, and formed into escarpments, like the deposits of this country. Thirty or forty of the shells found in the Russian limestone are the same with those described in the works of Phillips and Sowerby, and other writers on the subject of fossil zoology. This range is mixed with splendid cliffs of alabaster of immense dimensions, which were never observed before by any naturalist. Siliceous matter is also found disposed throughout the limestone. He next adverted to a want of continuity in the oolitic formation, although he observed there was no want of conformity. He then proceeded to describe the tertiary strata, where he was fortunate enough to discover shells exactly the same as those in the existing seas. These shells were found 500 miles in the interior, and 300 feet above the level of the sea. This was a most important point, showing that at no remote geological period the whole empire of Russia in Europe has been covered by the sea. He then described the enormous accumulations of drifted materials found in the tertiary formation, consisting of boulders and great blocks at St. Petersburg; of the Silurian detritus at the Devon formation; the oolite masses being covered with fragments of the detritus of the great white formation of the limestone. He concluded by shortly describing the trap rocks, which succeed the deposits that came more immediately under his observation.

Mr. Craig stated the substance of a long and interesting paper on the Coal Formation of the West of Scotland, which we may give in a future number.

Mr. David Milne gave an account of the recent earthquakes in the north of Scotland, and described the geological structure of the districts where they occurred, offering some ingenious theories as to their causes and mode of operation. On a comparison of the barometrical observations which had been made at the periods when shocks of earthquake had occurred in Scotland during the last fifty years, he found that 129 had occurred in winter, when the barometer was at the lowest, and 61 during the summer months; that in England 118 had occurred in Winter, and 75 in summer; on the Continent a similar proportion had been found to provail. The severe shocks at Comrie last year, occurred in October, when the temperature was lower than it had been for ten years, and an enormous quantity of rain had fallen, a meteorological phenomenon which also appears to accompany earthquakes in this country. It was found that the earthquakes in the north of Scotland had no connection with those that had been experienced on the Continent or in Ireland.

Section D.—*Zoology and Botany.*

Dr. Fleming in the Chair.

Mr. Strickland read a paper on the true method of discovering the natural system in Zoology and Botany. The object of this paper was to show that the affinities of species and groups follow no regular or symmetrical order, such as is exhibited in artificial systems, but that they radiate and ramify irregularly in all directions. He consequently infers that the only means of arriving at a knowledge of the true system is, to discard all *a priori* considerations, and to trace out and delineate the affinities of species by an inductive process, similar to that of a geographical survey. In illustration of this, he exhibited some sketch maps, intended to show the true order of affinities in certain families of birds.

Dr. Lizars read an interesting paper on the organs of sense in the salmon. After alluding to the importance of combining the investigation of the structure of animals with their external character, and stating that the anatomy of the salmon had hitherto been almost entirely overlooked, he proceeded to describe the anatomy and functions of the organs of the senses in this important animal. After dissecting the skin, he arrived at the conclusion that it was not very highly organised for the function of touch. He arrived at the same conclusion with the organ of taste. The organs of smell, sight, and hearing, he minutely explained, and demonstrated satisfactorily that these organs were highly developed. In the course of his interesting remarks, he showed the analogy of these organs to the organs of sense in man, and illustrated his remarks by a series of magnificent paintings and drawings.

Professor Agassiz, who spoke at considerable length in French, announced the extraordinary discovery, lately made by him, that the protococcus nivalis, a minute substance which colors snow red, is not, as has hitherto been supposed, a vegetable, but the egg of an animalcule, a species of rotifer. This he had proved by examining the protococcus in all states of development, and by finding the ovaries of the rotifer filled with it. He also gave an account of an insect of the Podura tribe, a new genus, which he has discovered in great numbers inhabiting crevices in the ice of the glaciers. This creature is supposed to feed on the animalcules which abound in the ice. The learned Professor illustrated his remarks by exhibiting a number of beautiful drawings.

Meeting of the General Committee.

A meeting of the General Committee was held in the Faculty Hall. After the usual preliminaries, it was unanimously resolved that the next meeting of the Association should be held in Devonport, Plymouth, and Stonehouse, and that Professor Whewell should be requested to act as President on the occasion. The appointment of subordinate local officers likewise took place, after which the general secretary, assistant-gene-

ral secretary, general treasurer, and secretary to the Council, were re-appointed. Previous to the breaking up of the meeting, the Treasurer, Mr. John Taylor, stated that, up to Saturday night last, the receipts to the funds of the Association on the present occasion amounted to £2,490—a sum which had only once been exceeded since the formation of the Association.

SECOND PROMENADE.

The second and concluding promenade took place on Monday night in the Royal Exchange.

We have not space, this week, to notice the proceedings in the Sections, on Tuesday and Wednesday, on which day they came to a close, we shall conclude the report of them next week.

On Tuesday night, the Grand Dinner of the British Association took place in the Theatre. Covers were laid for one thousand gentlemen, and they were all filled.

The Marquis of Breadalbane took the chair. Among the company present were,—the Marquis of Northampton, the Lord Provost of Glasgow, Lord Greenock, Lord Belhaven, Mr. Murchison, Dr. Buckland, Sir David Brewster, Sir Archibald Campbell, Major Sabine, Lord Monteagle, Sir John Robison, Professor Forbes, Sir William Jardine, Professors Phillips, Agassiz, Link, Encke, Jacobi, Varrentrap, Klossch, Schafbeutt, Otto, Bunsson, Kurochner, Vogel, &c., &c.

In the course of the evening many speeches were made, but they were destitute of interest.

The General meeting assembled on Wednesday, in the Faculty Hall, Lord Breadalbane in the chair.

Major Sabine, the Secretary, announced that the committee of recommendations had been constituted on the principle of representation, every section having now members to advocate their respective interests. He then proceeded to read the recommendations for reports divided into three classes. 1st. Money grants. 2d. Reports not involving expenditure. 3d. Representations to government.

SECTION A.

	£	s.
1. Hourly meteorological observations in Scotland	85	0
2. Tide Discussions	50	0
3. Tide Discussions at Bristol	50	0
4. For barometric and thermometric instruments	20	0
5. For the reduction of meteorological observations	100	0
6. For the reduction of Lecaille's stars	50	0
7. For the reduction of the stars of Histoire Céleste	150	0
8. To extend the Royal Astronomical Society's catalogue	150	0
9. For Osler's anenometer and for tabulating observations	50	0
10. For magnetic observations	50	0
11. For two actinometers to enable Professor Agassiz to make observations in the high passes of the Alps	10	0
12. To ascertain the action of gases on the light of the solar spectrum	184	0
13. For the expenses of meteorological observations at Plymouth	20	0
14. For barometric and thermometric observatfons at Plymouth	35	0
15. For the reduction and tabulation of observations on subterranean temperature	20	0
16 For magnetical observations, instruments, &c.	50	0
Total Section A.	1,149	0

SECTION B.

1. For the translation of foreign scientific memoirs	100	0
2. For experiments on the action of sea water on cast and wrought iron	50	0
3. For experiments on digestion.	200	0
Total Section B.	350	0

SECTION C.

1. For researches on the mud of rivers.	20	0
2. For maps and colored drawings of railway sections before they are covered in	200	0
3. To enable Professor Agassiz to report on the fossil fisshes of Scotland, especially those of the old red sandstone	100	0
4. To ascertain temperature in Irish mines	10	0
5. To register shocks of earthquakes in Scotland and Ireland	20	0
6. For experiments on the solution of silica in waters of high temperature	25	0
Total Section C.	375	0

SECTION D.

1. For experiments on the preservation of animal and vegetable substances	6	0
2. For researches with the dredge, with a view to the investigation of the marine zoology of Great Britain	50	0
3. For the engraving of skeleton maps for recording the distribution of plants and animals	25	0
4. Something "Britannica" (1 lost it)	50	0
5. Investigation of plants and animals in water	6	0
6. To ascertain the longest period seeds retain vegetation, and the best mode of preserving them	10	0
7. For printing and circulating a series of questions and suggestions for the use of travellers and others, with a view to procure information respecting the different races of men	15	0
Total Section D.	162	0

SECTION E.

1. For experiments on medico-acoustic instruments	25	0
2. For investigations on the veins and absorbents	25	0
3. For experiments on acrid poisons	25	0
Total Section E.	75	0

SECTION F.

1. To give encouragement to numercial analysis of education in Great Britain	100	0
2. Vital Statistics	100	0
3. Statistic of the coal districts of Great Britain	25	0
Total Section F	225	0

SECTION G.

1, Experiments on the maximum effect of steam-engine condensers	25	0
2. For experiments on the forms of vessels	100	0
3. Dynamics of steam-engine	100	0
4. For the purchase of Roberts's instrument for measuring short intervals of time (to be employed in experiments. Sec. G., No. 2)	30	0
Total Section G	255	0
Making a total of	£2,591	5

Some of the foregoing are renewals, or balances of former grants; but they speak much for the utility of the British Association, as also do the following reports called for.

SECOND CLASS, REPORTS:—

On the progress in astronomy during the present century.

On the best mode of publishing the hourly meteorological observations now in the possession of the Association.

On the phenomena of sound.

On the differential and integral calculus.

On vision.

On the application of a general principle in dynamics to the theory of the Moon.

On the undulation of fluids and elastic media.

On the conduction of heat.

On the meteorology of the United States.

How far are experiments to ascertain the state of the atmosphere by balloons, desiderata?

On inorganic chemistry.

On electro-chemistry and electro-magnetism.

On chemical geology, in reference particularly to the igneous rocks.

On the connection between agriculture and chemistry.

On the habits of radiated animals.

On the combustion of coals, with a view to obtaining the greatest calorific effects and the least smoke.

On the resistance of the atmosphere to moving bodies.

On the Turbine water-wheel.

In all eighteen.

THIRD CLASS.—Representation to government on the importance of the reduction of the Greenwich observations. Already, in 1837, government had assigned £50, and subsequently £2,000 for this work. The object of the representation is to inform the government that those sums have been expended, and to state that about £2,000 more would probably be required to complete it; also to state the sums the Association themselves have laid out on these reductions.

(To be Continued.)

POLAR OSCILLATION.

To the Editor of the "Inventors' Advocate."

(Continued from Page 189.)

In Mr. Saull's "Essay on the Coincidence of Astronomical and Geological Phenomena," page 13, Mr. Saull observes, "First, then, I find that in all the ancient erections a change has taken place in the meridian since their erection, showing a shifting of the pole, &c."

Again at page 18 Mr. Saull says, that "the earth's axis is not at rest on its surface." And in support of this theory, Mr. Saull has given tables showing the variations of the latitudes and longitudes of places on the earth's surface as follows, viz.:—North Bergen, 3 min.; Rhodes, 11 min.; Alexandria, 1 min.; Naze of Norway, 12 min.; Christiana, 15 min. The above are an *increase* of latitude during a period of 80 years, or from 1750 to 1830.

At the following places the latitudes have *decreased* in the same space of time, viz.:—Wyburg, 13 min.; Rostock, 33 min.; Archangel, 4 min; Drontheim, 27 min.; Stockholm, 1 min.; Petersburg, 4 min.; Cape Candinose, 23 min.; Weigate Straits, 70 min.; Nova Zembla, 50 min. While at Venice, Rome, and the North Cape, there has been no variation. From the above results, &c., Mr. Saull infers that the pole has a *westerly* motion; but, as I have before observed, no theory can be based on data so discordant. The discrepancies in the above results are evidently derived from erroneous observations, and will not in the least degree confirm the theory Mr. Saull endeavors to establish.

The axis of the earth, as I have before remarked, always remains parallel to itself, and must continue so to do, unless the northern and southern hemispheres of the earth should (as have been suspected, from the result of measurements on the earth's

surface) be found to be of a different figure, or one of them contain a greater quantity of matter than the other, in which case the attractions of the planets, &c., might draw the axis of the earth out of its parallelism,* but as no such motion has hitherto been appreciated,† if it really exists it must be *extremely slow*, and its consecutive period must occupy *many millions* of years.

I am, Sir,

Yours respectfully,

Lynn Regis, 15th Sept., 1840.

J. UTTING.

To the Editor of the "Inventors' Advocate."

Sir,—Permit me to occupy a few lines of your valuable space, to show that Mr. Utting has omitted the words "*quoad* the earth" in quoting my remarks, and thereby makes it appear that I am the author of the error regarding the "variation of latitudes," which I wrote purposely to overthrow. This he does also by asking, "if the pole of the earth remain where it is, how can a revolution of the pole of the ecliptic produce any variation of the latitudes and longitudes on the earth's surface?" Why, sir, it was not I, but Mr. Utting, who stated that such an effect would result from the cause mentioned. He gave, at page 158, as a reason why Mr. Saull's theory was "untenable," that no "variation in the latitudes of places on the earth's surface" has been detected. I reply that polar transition, *id est*, a revolution of the pole of the ecliptic, would not affect the latitudes, or relation of the pole of the earth to the equator; and he rejoins by asking "how" the very thing he had declared, and I denied, could take place? I do think, therefore, that I am not wrong in the assertion that Mr. Utting had mistaken the question.

My letter has induced a further statement in defence of the theory of *Laplace*, which I offer no remark on, as it is not yet complete; save that I remind Mr. Utting that the whole question is—whether *Laplace* be correct in his theory of "*oscillatory* motion," or there really be "a *consecutive* motion of the obliquity," which would carry it entirely round "in about $2\frac{1}{2}$ millions of years;" and so cause the sun to be vertical at the poles twice in that period. As yet no *proof* against this latter opinion has been given, while all the weight of Hindoo astronomy and geological phenomena is in its favor.

Yours, &c.,

R. J. MORRISON, Lieut. R. N.

* No variation in the latitudes would result from this circumstance.

† "All astronomers have assumed the *invariability* of the axis of rotation of the earth, and the *uniformity* of this rotation." "The axis of the earth moves about the poles of the ecliptic, but since the epoch, at which the application of the telescope to philosophical instruments furnished the means of observing terrestrial latitudes with precision, no variation has been recognised in these latitudes, but what may have arisen from the errors of observation, which proves that since that epoch the axis of rotation has existed very nearly on the same point of the terrestrial surface; it therefore appears that this axis is *invariable*. (Laplace Systeme du Monde.)

ADVERTISEMENTS.

THE CIVIL ENGINEER and ARCHITECT'S JOURNAL, SCIENTIFIC and RAILWAY GAZETTE; No 37, for October, price 1s. 6d.; contains—Drawings and Description of the Reform Club House—Papers on Architectural Competition—Candidus's Note Book—On Cuttings and Embankments—Greek and Roman Art—Public Buildings, by Ralph—Stone for the New Houses of Parliament—Firing Blasts under Water—Felling Timber—Tide Guage—Ystaly-fera Anthracite Iron—Improvement of Lough Erne, Ireland—Iron and Timber-built Ships—Report of the British Association—Reviews of New Books—Proceedings of the Institution of Civil Engineers—List of New Patents—and numerous professional communications and remarks.

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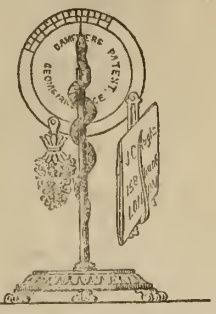

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Mining Journal Office, 37, New Broad-street, City, 27th June, 1840.

NEW WORK ON THE IRON TRADE.—The Number of the MINING REVIEW this day published, contains the Sixth Part of the Paper on the IRON TRADE, by Harry Scrivenor, Esq.—this work will be completed in Twelve Monthly Parts, and so arranged as to form a separate volume at the end of the year; in addition to which the MINING REVIEW contains—A Paper on the Establishment of a School of Mines—On the Ventilation of Mines, by Samuel Moyle, Esq., C.E.—On the Preparation of China-Clay, by W. J. Henwood, Esq., F.R.S., &c.—On Blasting Limestone Rock, being an Account of Blasting the White Limestone in the Country of Antrim, Ireland, by William Bald, F.R.S.E., M.R.I.A.—On the Applicability of Peat to Manufacturing Iron—Parliamentary Returns of the Imports and Exports of Copper, Lead, and Tin, for the year ending 5th January, 1840—Scientific Bodies, &c.—The MINING REVIEW is published at the office, as above, on the 1st of each month, price Sixpence.

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THE

INVENTORS' ADVOCATE,

AND JOURNAL OF INDUSTRY;

A WEEKLY BRITISH AND FOREIGN MISCELLANY OF

SCIENCE, INVENTIONS, MANUFACTURES, & ARTS.

No. 63.] SATURDAY, OCTOBER 10, 1840. [PRICE FIVEPENCE STAMPED. CIRCULATING FREE BY POST.

ADDRESS TO INVENTORS AND PATENTEES.

The INVENTORS' ADVOCATE has this week entered on a fresh scene of action, and a new era of its existence. The Proprietors, encouraged by the success which has attended their exertions, have enlarged their sphere of operations, so as to enable them to conduct the INVENTORS' ADVOCATE, and the Patent Agency with which it is connected, on a scale commensurate with the growing importance of both. At the time of entering on such a change, the Proprietors seem called upon to deviate from the rule they have hitherto observed, of not obtruding on public notice beyond the advertising columns of their Journal; and to allude, in this place, to the principle on which their Patent Agency business is conducted, and to point out some of the abuses of the present system.

The connection, which it must be well known to the readers of the INVENTORS' ADVOCATE, exists between this Journal and the Patent Office, is mutually advantageous. It is the means of supplying the Journal with correct and early knowledge respecting patents of new inventions at home and abroad; whilst the stores of information collected by this means, and from numerous other original sources, furnish a valuable record in the pages of the INVENTORS' ADVOCATE, for consultation by all persons at the present and in future times. These two branches of the establishment, which have hitherto been carried on in separate and comparatively inconvenient offices, are now comprised within the same premises, centrically situated, and in every way adapted to give efficiency to the arrangements which have been made for increasing the publicity of the Journal and for affording additional convenience and facility for patenting inventions and for making them more generally known. To effect the latter object, a Gallery for the exhibition of new inventions will be joined to the establishment, in which curious and novel contrivances, and plans and models, will be collected for public gratuitous inspection.

The system which the Proprietors of the INVENTORS' ADVOCATE have uniformly adopted in conducting their Patent Agency, is to avoid all useless mystification and expense; to act as confidential advisers in bringing to perfection and securing the products of inventive genius; to give opinions on questionable points of patent right; to afford information relative to conflicting or disputed inventions; and to obtain for inventors the most ample protection for their labors, in the shortest and cheapest manner that our present clumsy, unjust, and expensive patent laws will permit. The extensive connection which the Proprietors have established on the Continent give them, also, peculiar advantages in obtaining, with expedition, security, and economy, patents in all foreign countries. By well concerted arrangements at home and abroad, their Patent Office thus becomes a ready and efficient medium of communication between Inventors and Capitalists, and many useful inventions that would otherwise be lost, may by timely patronage be brought to light.

The imperfections and extortionate injustice of the Patent Laws have been often adverted to in the INVENTORS' ADVOCATE. We shall not fail to prosecute the subject at every fitting time, in order, if possible, to rouse the attention of the Legislature to the importance of remodelling those laws on principles of justice, common sense, and sound national policy; so that they may serve to stimulate, instead of to stifle, the efforts of inventive genius, and protect inventors in the enjoyment of property, the right to which is based on a more solid foundation than that of any other property in existence.

The injurious effects of the present state of the Patent Laws is considerably aggravated by the monopoly which has been maintained, of the business of patent agents. Certain parties, holding office in the department of government connected with patent grants, have not only joined to their official situations the *private business* of Patent Agents, but they have endeavored to establish a monopoly of such business, by making it appear to be connected with, and to form part of, their official duties. For a length of time, the assumption of exclusive privilege to secure patents was undisputed. It was stated that peculiar facilities were afforded by connection with the government office, and that patents could therefore be procured with greater ease, more security, and at less expense. An attempt was at last made to break down this unfair monopoly. A clever and spirited individual attached to the monopolising establishment, in conjunction with another, opened a rival office for taking out patents. They encountered in the first instance, some vexatious, petty opposition, indicative of the dislike to this invasion of the tabooed ground, but they eventually succeeded. The monopoly has since been attacked by others; yet, so strong is the hold of former habit, the advantage of early possession of the field, and the false prestige of official connection, that the monopoly, though shaken, is still upheld.

The Proprietors of the INVENTORS' ADVOCATE, have no desire to disparage the honest endeavors of competitors for public patronage; but they have reason to know, that, in the instance to which they refer, the most unwarrantable representations have been made to secure the monopoly of Patent Agency, and that the government connection has been perverted to the purposes of private trade, in a manner altogether unjustifiable. Inventors have been told, that patents taken out by other than the favored agents are in greater danger of being opposed successfully; and that the connection with the government enables the favored party to expedite a patent through its different stages more rapidly, and at less expense, than can be done by others. Such representations we know are gross libels on the Attorney and Solicitor General, and on the different departments through which patents have to pass. That they are guided in the performance of their public duties by private interest or favor is, we are persuaded, from our own experience, without foundation; but the circumstance of their being open to such suspicion, and that such insinuations should be made by *their own officers*, shows strongly the impropriety and incompatibility of this system of private trading under the government flag. For our own parts, we cannot speak in terms of too great praise, of the urbanity with which we are supplied with the information for which we have recourse to the various offices, in the exercise of our editorial functions; and we have pleasure in stating, that in the sentiments we have just expressed, we are but the echo of persons close to head quarters, who, with full opportunities of observing the abuses we have alluded to, are most anxious to see them removed. We are, therefore, full of hope in the success of the cause we are supporting, and shall steadily follow up the blow we have struck, by an unrelenting warfare against the official monopoly system, until we obtain for Patent Agency business, "a clear stage and no favor."

MEMOIR OF LAVOISIER.

The following memoir of the distinguished chemist, Lavoisier, is translated from a forthcoming French chemical work, from which we some time since extracted an article on the objects, the importance, and progress of chemistry. The present portion of the memoir relates to the mode of life of the great chemist; the subsequent portion will have more immediate reference to the progress and results of his chemical labors:—

In these days, it will scarcely be credited that there are men to be met with, of acknowledged talent and science, who deny the importance of chemistry, who degrade its discoveries to the narrow limits of a science fit only for the amusement of children; men who make the same answer that was given by J. J. Rousseau, when attending Rouelle's course of chemistry: "I will not believe the analysis of wheat, until I see chemists compound it again."

What answer is to be given to those men who enlist their talent and scepticism in the service of their incredulity?. Nothing, except by the wonderful discoveries that the commencement of this century, and the conclusion of the last, are indebted for to chemistry. It is indeed easy to prove that there are bodies which chemists can decompose, which they are unable to compound again. The causes of this are evident: they exist chiefly in the changes which influence the elements.

We think this subject ought to be insisted on, because objections are used every day analogous to that of Rousseau. It is observed, "You say that sugar is composed of 24 parts of carbon, 22 of hydrogen, and 11 of oxygen. Well, take the requisite quantities of these substances, make sugar, and then I will believe you." Let us answer with M. Thenard, not by words, but by well-established facts, which all the world can understand. If carbon, hydrogen, and oxygen were mere liquids, nothing could oppose their combination. It would take place at the usual temperature, and it is probable that a great number of vegetable substances could then be formed. But the carbon is always solid, the hydrogen and oxygen are always gaseous: therefore, the cohesion of the first, and the elasticity of the two others, are obstacles which affinity cannot overcome. Heat, then, must be employed to effect the reunion, but the consequence of applying heat would be, that if a vegetable substance could be formed, the heat would destroy it. Thus, it is impossible, by such means as we possess, to form these kind of substances from all their separate parts; it is in the act of vegetation that *nature* creates them. Let us turn to the chemist who has boldly removed the veils that ancient chemistry vainly endeavored to raise,—to the philosopher who has created the new era. Let us listen to the learned professor and brilliant orator, M. Dumas, who has with so much talent brought to light the numerous works and the theory of Lavoisier, in his lectures on philosophical chemistry at the French College.

Lavoisier is perhaps the most celebrated, the greatest man of science, that France has produced. He was born at Paris on the 6th of August, 1743, six months after the birth of Scheele. His father, who possessed a considerable fortune, acquired in commerce, placed him at the Mazarin College, where his progress was very rapid. Perceiving him animated with ardent zeal for the study of science, he had the good sense to allow him the entire disposition of his time, rightly confiding in his judgment. Thus, he left him at liberty to pursue the natural dictates of his mind, instead of binding him to an occupation, and restricting him to a routine life; he left him to his own suggestions at an age when the imagination, replete with ideas, possesses treasures of fertility. Thus, we behold him devoted to the most various scientific studies, but always with profundity. He studied mathematics and astronomy under the Abbé Lacaille: he received lessons in botany from the illustrious Jassieu. At length he wished to study chemistry, and for Rouelle, who was then a distinguished professor, was reserved the honor of being Lavoisier's first instructor in this science.

For some time Lavoisier was undecided as to the plan he should pursue; in his mathematical studies and in his studies of the natural sciences, he was equally successful. At one time, he might have been thought devoted to chemistry, led on as he was by the great zeal of a man to whom we are indebted for the first attempts of a geographical map of France. Guettard wished to engage him in his great undertaking; he inspired him with a taste for geology, and Lavoisier applied to it with ardor. Indeed, we are in possession of a geological memoir, one of his earliest scientific publications, and though it was published during the latter period of his life, was nevertheless written in 1767, at the commencement of his career.

At the solicitation of the administration, the Academy had proposed a little before this time to award a prize to the best memoir on the lighting of Paris. Lavoisier wished to engage in this competition, and it afforded him an opportunity of distinguishing himself by one of those actions which discover a character so firm and decided, that it shrinks from no difficulty. After several experiments, he perceived that his sight wanted the delicacy necessary to ascertain the relative intensities of the different flames that he wished to compare. He therefore ordered a chamber to be hung with black, where he shut himself up for six weeks in total darkness. At the conclusion of this time, his sight had acquired extreme sensitiveness, and he was able to perceive the slightest differences. But how great must have been his devotion to science, to condemn himself at 22 years of age to so long and so rigorous a seclusion! This devotion was rewarded, for the Academy, in 1766, decreed him a gold medal on this account.

His firm and tranquil mind had already been proved on another occasion. The distinguished position of his family obliged him to exercise some social duties, but society disturbed and fatigued him, and he gave it up. Soon, however, want of exercise and unceasing application affected his digestion, he gradually diminished his diet. At length, for many months, he took no nourishment but milk, not shrinking, as we have seen, from any sacrifice, provided he could pursue without interruption, the inquiries that occupied his mind.

The very existence of a science known only by name, was then at stake, for it required reconstructing. This science was chemistry, which in details, is the most intricate of all the sciences, and which at that time appeared involved in inextricable mystery. Lavoisier accomplished the work he had in view, and he did not hesitate to sacrifice his life to this great object. But in order to succeed a studious and quiet life was absolutely requisite, for uninterrupted vigils were necessary. A large fortune was also required, for he wanted valuable materials and an expensive apparatus. From that time he began to organise his plan of life in the same manner that a general organises a plan for a campaign; he surveyed the extent of his mission, and prepared himself to accomplish it in his usual spirit of order and method.

Thus, in 1774, at the very time when he was devoting himself to his early experiments, in which the use of the balance was made essential in the study of chemical phenomena, we see him suddenly endeavoring to procure the financial situation of *fermier-general*, in order to obtain the necessary income. He obtained, at the same time, the hand of Mademoiselle Paulze, who was the daughter of a *fermier-general*.

His fortune having by these means become considerable, he was able to sacrifice a portion of his income to his experiments. This portion will appear very large, for it amounted from 6,000 to 10,000 frs., as has been ascertained since his death, from his laboratory accounts, which were kept with as much regularity as he kept the accounts of his public offices. His habits of order entered into the most minute details. His life would have been wholly absorbed by his numerous and in some measure new occupations, if that perfect order which is such a great assistance, if that singular presence of mind which admitted of his doing every thing at the appointed time, had not given him time to answer all the demands that his position and his inclinations required. Every morning and evening he devoted some hours to chemistry; the middle of the day was dedicated to business; he passed it in the conscientious discharge of the duties it imposed. But Sunday, that day of repose, was a day of perfect happiness to him, he never left his laboratory, and it was there that those meetings occurred, the memory of which has been transmitted to us by our fathers.

On a Sunday he received with unequalled kindness all the young people, whose knowledge of chemistry enabled them to derive benefit from his conversation. He drew around him all the learned men of the age, Frenchmen or foreigners. He invited all artists whose concurrence in the correctness of his experiments became every day more indispensible. It was to these conferences that the most celebrated men resorted, sooner or later, to offer their tribute of admiration to Lavoisier. It was there that after having listened to discussions on the most abstruse points of science, with a coldness that might have been mistaken for indifference, he almost always concluded by expressing an opinion in which every one concurred. Lavoisier was elected a member of the Academy of Sciences in 1768, at the age of twenty five.

Lavoisier had scarcely entered on the duties of *fermier-general*, when philosophers accused him of being a deserter, whilst his new associates considered him as an intruder incapable of rising to any distinction in the profession. The latter were soon undeceived. He shortly acquired a consideration among them which amounted to respect. It was to him that the Jews of Metz are indebted for the abolition of an odious tax, an old remnant of the barbarous ages. Under the ministry of Turgot, in 1776, he was placed at the head of the administration of the saltpetre manufacture, and it is to him that we are indebted for the abolition of the vexatious practice by which the persons employed were allowed to force an entrance into cellars of private houses, to carry away the depositions of nitre on their floors. He proved that this resource could be dispensed with, and that by using only plaster, it would be easy to quadruple the production. Thus Lavoisier put an end to these compulsory searches.

He published a paper on the manufacture of saltpetre, which has for a long time regulated our saltpetre manufactures; he improved the manufacture of gunpowder; and under all these circumstances do not let us forget it is Lavoisier, the *fermier-general*, who advised or who acted, although he had the *misfortune* to combine the intelligence of a man of business with that of a most experienced chemist.

In 1787, he was appointed member of the provincial assembly of Orleans. Lastly, to terminate this short review of his public life, he was appointed member of the celebrated commission of weights and measures.

(To be Continued.)

STEAM-ENGINE MANUFACTORY AT INDRET.

The manufactory at Indret is destined to become the most important establishment in France for the manufacture of steam-engines. The existing political circumstances, the great progress that has been made for some years past in steam navigation, the establishment of many Trans-atlantic packet-boats propelled by powerful engines, have obliged the government to endeavor to make itself independent of England in the manufacture of steam-engines. There were two means of accomplishing this, the first was to apply for assistance; the second was to depend on itself. It is a very serious question in political economy, and one very difficult to determine, whether the interests of a country be best

promoted by great public works being committed to private enterprise, or undertaken exclusively by the government. The government has always adopted the latter means, and has turned towards Indret with a view to make it in some measure the manufactory of the kingdom. In its present state this establishment is composed of six great workshops; the foundry, the pattern departments, the forges, the fitting-up shops, and the boiler manufactory. The foundry is very extensive and well arranged. The old octagon shop, in which the cannon for the navy were cast, has been preserved, and is well adapted for casting the cylinders of the steam-engines. A second and larger place is appropriated to more extensive castings. In a third chamber the smaller pieces are cast. Lastly, a fourth place is appropriated to the copper castings. This department employs above 70 workmen.

In the building for working the wrought parts of the machinery, there are 36 forges. They are not large, but the forges are admirably arranged. They appear to be very confined, yet each has as much space as is requisite. Besides these 36 forges, there is a furnace for heating and welding iron, which occupies little room, and produces a great heat. This furnace serves to heat the large pieces of forged iron which are to be hammered. The axle-trees of engines of 160 horse power are nearly the largest pieces that can be forged in this workshop, on account of the small size of the furnace and the hammer. This shop occupies 100 workmen. The fitting-up shop, in which the different parts sent in by the foundry and forges, are finished, likewise occupies 100 workmen. Lastly, the brass foundry, where the steam boilers are constructed, occupies about 80 men.

The following are the engines at this time in progress. The engines of the *Gassendi*, of 220 horse power; those of the *Brandon*, of 160 horse power; a new apparatus of 60 horse power, on a new system of Mr. Rossin's, sub-director of Indret; a boat intended for the Senegal; a new steam hammer by the same engineer, intended for forges; and various small engines requisite in the workshops.

In its present state, the steam-engine manufactory can furnish three engines of 160 and 220 horse power a year: it is intended that it should furnish twelve of 450. There is a great deal to be done before this can be accomplished; but at the same time it must be confessed that the works are carried on vigorously, and that the government apparently wishes to accomplish its object as soon as possible. The expense of the establishment at Indret which was last year 700,000 francs, has now reached 2,000,000, and may be yet increased, for all the workshops ought to be tripled. All this will require time, but in less than eighteen months, if the ministers do not relax their exertions, the manufactory will be able to make engines of 450 horse power.

Besides the workshops for the manufacture of engines, there are also at Indret timber-yards for the construction of steam-boats. These timber-yards contain five slips; one of them is occupied by the *Gassendi* of 220 horse power; another by the *Rapide* of 80 horse power, intended for a steam-tug to Cherbourgh. The first of these boats will be launched towards the end of this month. There will be four ship-building sheds, in which will be placed the four vessels of 220 horse power intended for the colonies.

All the works are conducted under the direction of four engineers, who reside there; that is to say, a director, a sub-director, and two engineers.

REGULATIONS FOR ENGINEERS IN THE BRITISH NAVY.

The Lords of the Admiralty have published regulations as to the qualifications and examination, and the rank, pay and appointments of engineers in her Majesty's service. According to these regulations no person will be considered qualified to hold the warrant of a first-class engineer who is not able to keep accounts, and to make notes in the log of every particular of the working of engines and boilers.

He must be thoroughly acquainted with the principles on which the machine works in all its parts, and capable of setting right any defects which may arise in the engine or boilers; and also to adjust the length of the various rods and motions, slide valves and eccentrics.

He must have been at sea as an engineer, and be capable of working, starting, and stopping the engines, &c., and to make rough sketches, correct in proportions, of any part of the machinery, and willing to take charge of, and teach, the apprentices.

Second engineers must not be inferior in education to the first engineers, and but little behind in mechanical acquirements, with the exception of the nice points of adjustment of slides, parallels, motions, &c.

Third engineers should be equal in education to the second and first engineers, and will be selected either from the senior class of apprentices, or appointed direct from a factory. They must be accustomed to engine work, and acquainted with the principles of the engine, with the names of all its parts, their uses, and effect in producing motion.

Examination.—No person will be deemed eligible for an appointment as engineer, or for promotion to the second or first classes, until he has passed an examination on the points above stated, or on such further points as the Lords Commissioners of the Admiralty may from time to time think proper to require before the chief engineer and inspector of steam-machinery, or such other officers as they may appoint for that purpose.

Engineers to be appointed by warrant from the Lords Commissioners of the Admiralty, or by Commanders-in Chief on foreign stations on vacancies occasioned by death, in the same manner as other warrant officers of the navy are now appointed.

No person to be deemed eligible for an appointment as engineer of any class until he shall have passed such examination as the Lords Commissioners of the Admiralty may from time to time think proper to require for such class, before the chief engineer and inspector of steam machinery, or such other officer as they may appoint for that purpose.

Engineers to be distributed into three classes, and to *rank next below carpenters*, and with each other according to their standing on the official list.

Pay and allowances to engineers when serving on board one of her Majesty's steam vessels in commission; or in any of her Majesty's dockyards, whenever their services may be required there; or in repairing their own or any other vessel in the home dockyards, Holyhead, the river Thames, Portsmouth or Plymouth harbour, or when the vessel to which they belong is paid off, and they are still retained on board:—

First Class.—12*l.* per lunar month, and 6d. a day for each engineer's boy whom they instruct.

Second Class.—8*l.* per lunar month.

Third Class.—5*l.* 6s. per lunar month.

When serving on board one of her Majesty's steam-vessels within the tropics, while the steam is up, one-half the amount of the pay of the respective classes in addition.

Engineers of vessels in commission, when employed in repairing defects of other vessels than those in which they are serving (except in the home dockyards, Holyhead, the river Thames, Portsmouth or Plymouth harbour), to be allowed extra pay, as warrant officers, in addition, according to the scale established by her Majesty's regulations.

When borne on the books of the guardships of the ordinary, and not actually employed in the charge or repair of steam machinery—1st class, per month, 7*l.* 17s. 0d.; 2d class, per month, 4*l.* 18s. 0d 3d class, per month, 3*l.* 8s. 0d.

Superannuation, to be upon the scale established for warrant officers of the Royal Navy by Order in Council of the 4th of April, 1838.

Regulations are also published for the instruction and qualification of engineers' apprentices. According to these regulations, boys entering as apprentices must not be less than 14 years of age. They are to be kept one year at Woolwich dockyard, where they will receive the necessary instruction and their capabilities be ascertained; at the expiration of the fifth year of their apprenticeship, having then reached the age of 19, if, on a strict examination, they be found qualified for the appointment of third-class engineers, they will be considered candidates for promotion, and will take precedence according to conduct and abilities.

ENGLISH EXPIRED PATENTS.

JOHN RISTE, of Chard, Somersetshire, lace manufacturer, for *improvements in machinery for making net, commonly called bobbin or twist net*, Oct. 4.

FRANCIS HALLIDAY, Esq., of Ham, Surrey, for *certain improvements on apparatus used in drawing boots on and off*, Oct. 4.

SPECIFICATIONS.

ENTERED AT THE ENROLLMENT OFFICE.

(*Continued from page* 212.)

ISHAM BAGGS, of Cheltenham, in the county of Gloucester, gentleman, *improvements in engraving, which improvements are applicable to lithography*, Sept. 17.—First claim.—The mode of constructing the swinging frame, by which it is rendered capable of doing several plates at one time, of the same or different sizes. Two vertical rods are suspended from the top of the frame by centre pins, from these rods are suspended four horizontal frames, which carry the centre carriages, from which the tracing points are suspended; a moveable table, upon which is fixed the plates to be engraved, is secured to the back of the machine over each horizontal frame, the plates being over the tracing points, which are raised to the plates by pulling a cord; at the bottom of the rods a frame is suspended, upon which is fixed a centre carriage, which suspends a blunt tracing point: the manner of operating is shown under the next claim.

Second claim.—The combination of the swinging frame with a pentagraph, or other such like instrument, for reducing or enlarging drawings.

To the blunt tracing point is attached the short arm of the pentagraph, to the long arm of which a tracing point is attached; the drawing to be copied is placed under the blunt tracing point, and a sheet of drawing paper under the tracing point of the pentagraph; the drawing is then carefully sketched with the blunt tracing point, by which means the tracing point of the pentagraph acts likewise on the drawing paper; an enlarged copy of the drawing will be thus produced; the tracing points are then raised to the plates by pulling a cord; the tracing point of the pentagraph is then taken in the right hand, and traced over the enlarged copy, communicating its motion to the tracing points by which the plates are engraved. In using this apparatus for the purpose of lithography, "unxious," or other suitable points are substituted for tracing points, and lithographic atones for plates.

Sir WILLIAM BURNETT, Knight, of Somerset House, in the county of Middlesex, *improvements in preserving animal, woollen, and other fibrous substances from decay*, Sept. 19.—Claim. The method of preserving animal, woollen, or other fibrous substances, by the use of the solution in the manner herein set forth.

This invention consists in preserving animal, woollen, or other fibrous substances, by submitting them to the action of chloride of zinc. A tank, or other vessel, of wood, or other suitable material, is filled about two-thirds full of chloride of zinc, dissolved in cold water, in the proportion of 1 lb. of chloride of zinc to 5 gals. of water; this is allowed to stand from 10 to 12 hours, when it is ready; the material to be preserved is then put into the solu-

tion, and is kept covered with the liquid from 48 to 56 hours, according to its density; it is then dried under cover.

JOHN JACKSON, of Manchester, in the county of Lancaster, ironmonger, *certain improvements in the making of nails, nuts, bolts, and rivets*, Sept. 19.—Claim. The combination of such, or similar parts. for raising, guiding, or falling a ram or weight for the purpose of manufacturing nails, nuts, bolts, and rivets.

The anvil, having a hole through it from top to bottom, of the shape of the nail required to be made, is placed at the feet of two perpendicular rods, upon which the ram slides; this ram has a die in its face, of the shape of the nail heads. On the top of the rods a drum is placed, and at the bottom, behind the anvil, is placed another drum, with teeth on its circumference; two endless chains revolve round these drums, the teeth of the lower drum taking into the links. The chains are joined at three equi-distant parts of their circumference by a short rod; the toothed drum is turned by two handles, but has likewise a loose and fixed roller, to work by power, being steadied in its revolutions by a fly-wheel; when it is put into action, a projecting piece, attached to the ram, catches one of the rods of the chain, and is thus raised to the top of the perpendicular rods; the chain is then pushed off by a projecting bar, and the ram descends, by its stroke forming the head of the nail; the projecting piece of the ram, catching at the next bar again, ascends, and the nail is forced out by a lever at the bottom of the anvil, and the above process is repeated.

THOMAS STIRLING, of Limehouse, in the county of Middlesex, *improvements in the manufacture of fuel*, Sept. 20.—Claim. The mode of manufacturing fuel from small coal, tar, and clay, and afterwards submitting them, when in moulds, to a considerable degree of artificial heat.

This is a new species of fuel, which is composed of the following materials, 100 lbs. of vegetable tar, 300 lbs. mineral or coal tar, 2,240 lbs. of small coal, which should pass through a sieve, having six holes or meshes to the square inch, and clay mixed with water to the consistency of tar, of which solution 105 lbs. is required. It is mixed in the following manner: the tar is boiled in a vessel, and the solution of clay poured into it; the boiling matter is then run into another pan placed over a furnace, and the small coal is intimately mixed with it. The fuel thus far made, is put into moulds of the size required; rectangular shaped moulds, similar to brick moulds, are preferred; several of these may be joined together. The moulds are then placed in an oven or kiln, heated from 250 to 300 degrees, Fahrenheit; they are allowed to remain there from an hour to an hour and a half, when they are taken out and allowed to cool, and the fuel is then removed from the moulds and is fit for use.

FRANCIS WILLIAM GERISH, of East-road, City-road, in the county of Middlesex, *improvements in locks and keys, and in other fastenings for doors, drawers, and other such purposes*, Sept. 20.—First claim. The application of a lock and key to the nob or handle of a lock to secure the same as herein described. This improvement consists in inserting a lock in the handle of a door lock, by which means the works of the door lock may be made of any size requisite for the sake of strength and security. The necessity of carrying a large key is done away with, for the handle when locked is immoveably fixed, so that a person having obtained the large key would be unable to open the door without the key of the handle.

2nd claim. The mode of constructing a lock or other such like fastening, by combining a bolt, spring, and pinion or toothed sector, within a tubular case. The lock is constructed with a forked bolt, which is acted upon by the key, which likewise acts upon two tumblers; the forked bolt takes into the scutcheon, which is fixed on the door, and so stops the handle from turning; the handle on being released turns the pinion or toothed sector, which takes into a rack, formed in the end of the bolt of the door lock, and draws it back; a coiled spring is affixed to the said bolt, which has a tendency to force it outward.

3d claim. The mode of constructing, for a lock or other such fastening, a key with a series of nobs or projections round its axis. This improved key has three nobs or projections, placed at different heights, and on different sides of its pipe; two of these nobs act upon the tumblers before mentioned, and the other one acts upon the bolt of the lock.

CHARLES HUME, of Sussex-place, Regent's-park, in the county of Middlesex, gent., *improvements in producing surfaces on leather and fabrics*, Sept. 23.—First claim is for the mode of preparing the external surfaces of leather, and fabrics made therefrom, with India-rubber (more or less dissolved) as a finished dressing. This improvement consists in applying a flexible waterproof surface to leather; the materials of which the surface is composed are as follows: 100lbs of India-rubber are cut up into small pieces or pressed into thin sheets between a pair of rollers; it is then dissolved in 200lbs. of turpentine, or any of the known solvents of India-rubber, and is allowed to saturate for 24 hours, when it is taken out and passed between two rollers, set very close, till it acquires the consisting of very stiff paste or putty; some lamp black being sifted on its surface to give it the proper hue. It is then kept in a tank of water till required for use. The pieces of leather to be prepared should be selected of an equal thickness and of near the same size; the edge of a piece of leather is then passed between two rollers, the lower one being quite dry, but the upper is kept wet by a damper, to prevent the India-rubber from sticking to it; the operator then wets his hands and takes sufficient India-rubber out of the tank, which he forms into a roll the breadth of the leather, and places it between the upper roller and the surface of the leather: the rollers are then put in motion, and the India-rubber is forced into the fibres and pores of the leather, which is then taken away to dry. After which, to give the leather a gloss, prepare the following: dissolve shellac with spirits of wine, to which add a little Venice turpentine, and give the leather two or more coats of this preparation.

2d claim. The mode of employing water on the surfaces of rollers when spreading India-rubber (more or less dissolved) on to the surfaces of the leather. This claim is to the mode of using water on rollers as above described, by means of a damper, to prevent the India-rubber sticking.

SAMUEL HILL, Sloane-street, Chelsea, Middlesex, *improvements in making bread and biscuit*, Sept. 25.—Claim. The method of preparing rice, when used in making bread and biscuit, and also the combining one or more of each of the two classes of ingredients, as herein described.

The two classes of ingredients used in these improvements, are, first, the flour made from wheat, barley, rye, Indian corn, or rice; secondly, arrow-root, tapioca, cassowa, sago, millett, corokan seed, sougee, and flour from the kitteel tree, and should be used in the following proportions: to four parts of the first class, add one part of the second class, and proceed in the usual way of making bread, excepting when rice forms one of the ingredients, when it will be better to steam it before using, and let the proportion used be rather less, say one sixth, or one eighth, to the other ingredients. Biscuits may be made of two, or more of the ingredients in the usual manner. Brown bread may be made by coloring the water used in mixing the ingredients with a little cocoa. This improved bread will be found to be more nutritious, may be kept for a longer time, and will be also cheaper, than the bread generally consumed. A coarse bread may be made for animals in the following manner: corn, oat, pea, bean, or rye meal, grain, malt dust, sago, paddy, rice, cassowa; any four of these ingredients, mixed with a portion of oil, beer, fat, jelly, &c., and then baked, will be found more profitable than corn or hay.

GEORGE RICHARDS ELKINGTON and HENRY ELKINGTON, of Birmingham, *improvements in coating, covering, and plating metals*, Sept. 25.—Claim first. The mode of coating copper and its alloys with silver, by the process of fusing silver upon the surface of the metal, whereby the coating of silver is alloyed or united with the surface of the coated metal.

Let the metal first be silvered in the usual manner, then submitted to a hot solution of nitrate of silver, concentrated according to the required substance of the coating; it should be then heated to nearly a red heat to expel all the acid; a quantity of calcined borax is then fixed in an iron pot, and a temperature raised until it is of a sufficient heat to melt silver; into this, the metal that has been coated is immersed, and moved quickly round. The process will be complete when the borax runs off the article on its being taken out of the pot. The coated article may be boiled in diluted sulphuric acid, (in proportion of one part acid to twelve parts water,) to remove any borax that may remain, and, then after being annealed, boiled in diluted sulphuric or muriatic acid to improve its surface.

Claim second.—The methods of coating metals with silver; first, by the use of oxide of silver, dissolved in prussiate of potash, soda, or any other analogous salt, or in pure ammonia. Secondly, by the use of the above, in connection with a galvanic current. Thirdly, by the use of a solution of silver in an acid, so as to constitute a neutral salt in connection with a galvanic current.

Let the metal first be silvered, and then for a thin coating let it be immersed in the following solution while hot:—To three pounds of prussiate of potash dissolved in water, add five ounces of silver in oxide, and then boil them together; if a thicker coating be required, the mixture should be allowed to cool, and after the article is immersed, it should be exposed to the action of a galvanic current, either by contact with a bar of zinc, or other electro-positive metal, or by two cylinders closed at the bottom, the outer one of glazed, the inner one of unglazed earthenware; let the space between them be filled with a solution of chloride of sodium; into this, a cylinder of zinc is placed with a copper wire soldered to it, so as to bend over and dip into the inner vessel, which contains a solution of silver, and in which the articles to be coated are placed, one part being kept in contact with the copper wire. Another method is to substitute for the above solution, a solution of silver reduced by an acid to "neutral salts," and then acted upon as before, by the galvanic current.

Claim third.—The methods of coating or plating metals with gold, first by the use of metallic or oxide of gold, dissolved in prussiate of potash, or any other soluble prussiate, or any analogous salt; secondly, by combining the use of the above with the application of a galvanic current.

To two pounds of prussiate of potash, dissolved in one gallon of water, add two ounces of oxide of gold, or metallic gold, in fine division; boil them for half an hour; and for a thin coating let the metal be simply immersed; for a thicker coating, let it afterwards be exposed to the action of a galvanic current, in the same manner as in coating with silver.

Claim fourth.—The mode of coating iron with other metals, by first cleaning it in a peculiar manner, as a preparatory process.

Let the iron be first freed from all grease, and kept in an electro-negative state during the action of the cleaning acid:—this is composed of one part sulphuric acid, and sixteen parts water, into which the iron is immersed, until a black scale of oxide is detached from the surface, which will then be bright; the iron is then to be immersed in the following solution, which should be boiling, and in a brass vessel: one pound of sulphate of copper, three pounds of water, and two ounces of diluted sulphuric acid; on being taken out, it will be thinly, but firmly coated with copper, and may then be acted upon in any way previously described in these improvements.

WILLIAM PALMER, of Sutton-street, Clerkenwell, Middlesex, candlemaker, *improvements in the manufacture of candles, and in apparatus for applying light*, Sept. 25.—Claim first. The mode of manufac-

+ Chas Keene

turing candles by the application of two or more platted wicks.

These wicks are each composed of three threads or cords, platted together, instead of loose cotton, or yarn, as now in use. A wire is then provided, having a notch at each end for every wick; a wick is then fastened to one of the bottom notches, and carried up the wire (with that side next the wire from which the strands branch outwards), and caught to one of the top notches; the wire is then placed with the wicks in the mould, and when the tallow is set, it may be withdrawn. This peculiar formation of the wicks, not only gives them greater firmness, but causes them to turn outwards as they are consumed, and thereby require no snuffing.

Claim second.—The mode of applying lenses to lamps.

A circular frame is attached to the gallery of the lamp. This frame has recesses of different lengths formed in its edge for the reception of the frames of the lenses, which are kept in their places by bolts, and may be raised or lowered by a regulating screw fitted to each recess for that purpose, so that a stream of concentrated light may be thrown in any direction, or in two or three different directions (according to the number of lenses employed) at the same time.

HENRY SMITH, of Birmingham, lamp manufacturer, *improvements in gas-burners and lamps*, Sept. 25.—The principal object of this invention is to obtain the whole of the light existing in a flame of gas, &c.

Claim first.—The mode of applying a deflecting surface by means of a glass support.

For this purpose a deflector is constructed with the lower part of glass, and the upper part of metal, through which there is an aperture scarcely so large as the flame; this deflector rests on the same gallery as the glass chimney, and is acted upon by the air, which enters it at the bottom, and passes through the flame in nearly a horizontal position, thereby greatly increasing the brilliancy of the light, which has then nothing to obstruct, it since the lower part of the deflector is composed of glass.

Claim second.—The mode of applying a deflecting surface within a glass chimney by means of wire supporters, or of an open frame.

In this part of the improvement, the deflector is not made with a glass bottom, and intercepts nearly the whole of the air, and then passes it through the flame.

Claim third.—The mode of applying a deflecting surface retained within the glass chimney.

This is by simply attaching a small spring or cut ring to the deflector, which presses against the inside of the chimney, and holds the deflector firmly in its place. In every position of the deflector in these improvements, the air for supporting combustion is caused to be deflected to a nearly horizontal direction against the flame.

JOHN LIBERECHT STEINHAUESER, of Upper Terrace, Islington, *improvements in spinning and doubling wool, cotton, silk, and other fibrous materials*, Sept. 30.—Claim first.—For the arrangement of a drag, for the purpose of retarding the progress of the bobbin.

Claim second.—For the construction and application of a metal tube to the spindle, with the general arrangement of the machine as hereafter described.

The spindle is placed in a horizontal position, instead of perpendicular, as in ordinary machines; a hollow tube is adapted to the spindle passing over it; at one end of the tube is a weive, the other end rests on a projecting shoulder on the spindle, and is prevented from shifting by a small ring or collar on the spindle. The tube revolves by means of a band running over the weive, the motion is communicated by a drum similar to those used in ordinary machines; to the tube are fixed fliers supported in a box which has a motion parallel to the spindle, and partakes of the rotary motion of the tube to which it is connected by a pin or stud, which takes into a slot in the tube, for the puppose of elevating and depressing the flier, and thereby arranging the yarn in a uniform manner on the bobbin. It may be necessary to remark that the spindle is not confined to a horizontal position, but may be placed at an angle of any degree of elevation; this improvement may also be applied to machines with perpendicular spindles. The small ring which keeps the tube from shifting is fixed by a pointed set screw, which keeps it firmly in its place; to this ring there is a piece of metal attached, which is provided with two holes, through which two parallel rods pass; the opposite extremities of these rods are firmly fixed to the saddle which carries a small weive or pulley which receives a rotary motion, and as it revolves presses in a groove which imparts the necessary drag to the bobbin.

When the drag is required to be decreased for fine numbers, the saddle and projecting rods will be found a sufficient drag to give the required steadiness to the bobbin.

It will be seen that by this arrangement the drag may be easily adjusted to the greatest nicety, and a most perfect steadiness imparted to the bobbin.

HENRY MARTIN, Morton-terrace Camden-town, *improvements in preparing surfaces of paper*, Sept. 30.—Claim first.—Method of coating paper with oil colors in connection with embossing.

Claim second.—Method of preparing paper hangings by first giving to the paper a coating of oil color.

Claim third.—Method of planishing the surface of paper after it has received a coating of oil color.

Claim fourth.—Method of applying oil color to the surface of paper by means of rollers.

The paper to be coated with oil color should be laid on a table of the same size as the paper, so that for a piece of paper twelve yards long, a table twelve yards long, and quite flat should be provided; the color is then to be applied all over as evenly as possible, for which purpose an ordinary brush may be used, care being taken to work the oil well out; then let a dry hard brush, with an even surface, similar to a clothes or a shoe brush, be applied all over the color just laid on, giving the brush a circular motion with a very moderate pressure, then let it be smoothed all over with a softening brush, one made of long camel's hair will answer best, and then leave it to dry.

Another method of coating paper with oil color is by means of two rollers between which the paper passes, with an endless felt; this felt passes into a trough containing the color, in which there is another roller partly emersed; the felt passes under this roller, and is thereby well covered with the coloring matter, which it imparts in a regular and even manner to the surface of the paper, on the same passing between the two first-named rollers, there is a scraper within the trough so arranged as to act upon the felt to prevent its taking up more than a proper quantity of the color.

For embossing, after the paper has been coated in either of the above ways, let it pass between properly engraved rollers, or if preferred, dies may be used in the usual well-known manner.

For hangings, after it has been coated let blocks be employed in the usual way for patterns. For imitation of marble, it is preferable to produce the design by liquid in the manner well known, and to be applied to the paper when the surface is not quite dry, to allow of its being softned by the smoothing brush.

For planishing, the color when used on the surface of the paper should be thick or round, and thinned with only turpentine; then let it dry sufficiently to allow the turpentine to evaporate, when the color will be set; then with a pallet knife or a trowel with smooth or polished face pass all over the paper with a slight pressure, and the required gloss will be obtained.

WILLIAM NEALE CLAY, of Flimby, Cumberland, *improvements in the manufacture of iron*, Sept. 30.—Claim first.—Mode of manufacturing wrought or malleable iron from iron ore, by combining with it 28 per cent, or more, of carbonaceous matters.

Take rich iron ore, or iron stones, or any other material containing 45 per cent., or upwards, of iron, and have the lumps well broken by mill stones or any other suitable means, till it is reduced to a state capable of passing through a riddle, or screen, with 36 meshes to the square inch; to 100 parts of this add from 30 to 40 parts of coal, slack, coke, charcoal, peat, anthracite, or any other carbonaceous matter, broken to the same size; let them then be well mixed, and put into an ordinary puddling furnace, in a suitable state for receiving pig or scrap iron; let the combination be well stirred every five minutes, until it assumes the appearance of becoming metallic, by the hottest parts combining together; the length of time required for this, must depend upon the heat of the furnace: when the metallic parts are combined, let it be balled, or conveyed to the hammer, or squeezers, to be operated upon in the usual manner.

Claim second.—The manufacture of malleable or wrought iron from ore, by combining with it 28 per cent. of carbonaceous matters, with pig or scrap iron.

The inventor wishes it to be understood that these improvements are confined to the combination of carbonaceous matters with the ore, in proportions of not less than 28 per cent.

THOMAS SMEDLEY, of Holywell, Flint, North Wales, gentleman, *improvements in the manufacture of pipes, tubes, and cylinders*, Sept. 30.—These improvements consist of manufacturing tubes, pipes, and cylinders, without the employment of any apparatus for drawing the same.

Claim first.—Mode of combining three, four, or more bowls, or rollers, for the purpose of making, pressing, and elongating tubes, pipes, and cylinders, without seam or joint, and without the use of a drawing bench.

On each end of a driving shaft is fixed a bevil wheel; this shaft is moved by any adequate power, and gives a rotary motion to two perpendicular shafts, by means of the bevil wheels working into mitre wheels, fixed on the ends of those shafts: these again give motion to two other shafts (which are fixed in a rectangular position to them), by means of spur wheels and mitre wheels working together; on each of these four revolving shafts is fixed a bowl, or roller, and they are placed so that by the rectangular position of the shafts the segments formed on their surfaces may meet and form a circle, so that on motion being given to the driving shaft, the four rollers will revolve, and all the gearing being of the same proportions, the movements will be equal. The tube or cylinder is then passed on a mandril of a peculiar construction into the circle formed by the four rollers, and by the revolution of these alone, instead of the drawing bench as usually employed, the tube or pipe will continue to pass to the required length, thereby improving the quality of the metal, or alloy, of which the tube is composed, rather than deteriorating it, as is the case when the drawing bench is used, in consequence of the great strain which must be applied. With reference to obviating the joint, or seam, the tubes should be cast in short lengths, and of a suitable size and thickness, and then passed through several series of the revolving bowls or rollers, each series gradually decreasing in size, until the tubes are of the required length and thickness.

Claim second.—New mode of constructing the mandril, on which tubes, pipes, and cylinders are made.

This is simply by constructing the mandril of three longitudinal pieces, so that by removing the centre, the remaining pieces may be easily withdrawn.

The inventor wishes it to be understood that he does not confine himself in this invention to [illegible] bowls or rollers, as in some cases, i. e. for the construction of large cylinders, &c., more may be required and employed.

JAMES STEAD CROSLAND, Holbeck, [illegible] engineer, *improvements in locomotive [illegible] engines*, Oct. 1—Claim first.—For the construction and arrangement of an endless chain, as a sub-

tute for the crank motion in rotary and other engines.

A long steam cylinder is provided with suitable slide valves, and slide valve boxes to the piston; three parallel rods are fitted with their outer ends keyed to the crosshead of the engine; there is a strong endless chain working on two toothed pinions, to one link of which there is a projecting boss, this is fitted to the crosshead; which is guided parallel by guide rods, so that on its forward motion the boss is dragged forward, and at the end of the stroke it slides down a parallelogram and passes the centre, and on the steam being admitted to the other side of the piston, the cross-head is drawn backward, and with it the boss, thereby producing a revolution of the two shafts. It may be necessary to remark, that the number of piston-rods is not confined to three, as in some instances more may be required.

Claim second.—For the construction and arrangement of slide valves and expansion gear, as hereafter described.

The steam is admitted at one end of the cylinder by the cross-head moving a boss, which slides on a guide-rod, and at the other end by the cross-head moving two levers which have double forks at their other end clasping the guide-rods of the cross-head.

For the expansion gear, the steam is shut off by levers, to each of which is adapted a roller, to enable the lever to slide easily over an elliptical bar; to the cross-head are adapted square rocking spindles, on which are keyed tongue levers, so that on the tongue levers being at one end of the rocking spindles, the full expansion is applied, and on their being at the other end of the rocking spindles, no expansion is applied.

Richard Prosser, Cherry-street, Birmingham, in the county of Warwick, civil engineer, *improvements in machinery or apparatus for manufacturing pipe*, Sept. 27.—The patentee claims the turning of strips of metal into pipes, by the use of four revolving grooved rollers; and likewise the combination of two or more sets of rollers, in order to perfect the welding of the pipe.

This invention consists of four revolving grooved rollers. The axles of the top and bottom ones are parallel, one of which being put in motion by power of millwork, communicates its motion to the other, by means of a spur cog-wheel taking into another spur cog-wheel fastened on the other axle. To the top and bottom roller is fastened a bevelled or mitred toothed wheel, which takes into another bevelled or mitred toothed wheel, fastened to each of the side rollers, and thus drives them. In the centre of the edges of each roller is a concave groove, the sides of the edges being bevelled; which, meeting, form the grooves into a circle, the size of the intended pipe. The grooves in the edges of the roller may be made square, or any other shape, according to the shape of the pipe required. The rollers revolve at the rate of three hundred feet per minute, passing ten feet of pipe between them in two seconds.

At the back of the machine is a long horizontal platform or table, at the other end of which is a fixed standard, into which (above the table) a screw is received; the screw is attached to the end of a mandril rod, which passes along the table, its length being adjusted by the screw; the mandril or piston being the size of the interior of the pipe, is placed in the centre of the circle formed by the grooves.

The skelps, or plates of iron, to be formed into pipes, are made red hot; and one end of them, say seven or eight inches, is formed into a tube, the edges nearly meeting; or its whole length is formed into a gutter or groove, by means of an instrument known in the trade as the crocodile, the upper jaw of which is convex, and the lower one grooved; the skelp is placed red hot upon the lower jaw, and the upper one being forced down upon it, thus forms it into a gutter or groove.

The following is the mode of operation:—The skelp is placed on the mandril, within the circle formed by the grooves; the rollers are then set in motion, which, compressing the skelp on all sides, weld the edges together, and thus form the pipe, which, as it is made, is forced along the rod of the mandril by the revolutions of the rollers, till the whole length of it, say 12 feet, has passed between the grooves. It is then removed with the mandril, which, being taken out and cooled, is returned to its place; or to avoid delay, another mandril may be substituted. From a plate of iron 11 feet long, 12 feet of pipe are produced.

The patentee likewise proposes to use two or three of these machines in concert, one behind the other; the circle formed by the grooves in the second one being rather smaller than that of the first, and the third rather smaller than that of the second; the pipe passes through the three in succession, beginning with the largest circle, by which means the edges are more securely welded together, and the pipe rendered more perfect. Should a curved pipe be required, the machines are placed more or less in the form of a semi-circle, according to the degree of curve wanted, and the skelp is passed through as before.

ENTERED AT THE ROLLS CHAPEL OFFICE.

(Continued from page 197.)

John Bethell, Saint John's Hill, Surrey, gent., *improvements in treating and preparing certain oils and fatty matters*, Sept. 28.—The object of this invention as relates to oils is to render either whale, seal, rapeseed, olive, palm, cocoanut, or other common oils more useful, either for lubricating machinery, or for the purposes of illumination. This is effected in the first place by separating, clarifying, or precipitating a portion of the gelatinous, albuminous, or other matters contained therein; and in the second place, when required for the purposes of illumination by adding a portion of either of the hydrocarbons or essential oils. As relates to fatty matters, the object is to obtain from butter of palm, cocoa-nut oil, or any other vegetable concrete oil, an oil which is more useful in mixing with the purified oils; also to improve fatty matters.

For oils, they are first purified from the gelatinous, albuminous, and other matters, by well mixing them with a solution of tannin. If the tannin be derived from gall nuts (which answers best) 10 gallons of the solution should be used to 100 gallons of oil; let it be well mixed and then left to rest for 3 or 4 days, when all the tannin infusion and precipitate matter will have settled to the bottom; then let the clear oil be drawn off, and with a solution of 1 lb. of sulphate of zinc to every 6 gallons of water used, be well agitated, after 3 or 4 days the oil must be again drawn off, and if not sufficiently clear, should be filtered in oil bags in the usual manner. The oil throughout the above process should be kept at a heat as near to 70 deg. Farht. as possible. To make an improved oil for illuminating purposes, purified oil should be used with an addition of from 5 to 10 per cent. of either petroleum, or rock oil, Persian naphtha, fine oil of turpentine, or the best essential oil obtained from a distillisation of coal tar.

With reference to the treating of fatty matters take butter of palm or any other concrete vegetable oil, and add about 20 per cent. of either of the essential oils before named, put them into a still, and distill off the essential oil, and the volatile matter which rises is to be conducted off through a pipe to a worm placed in cold water, and thereby condensed; this may then be mixed with the oils for burning. The fatty matter remaining in the vat may then be run into casks, and will be found much improved for many purposes. It is better to use steam in distilling the above, which steam should be applied by a perforated branch pipe in an ordinary manner.

Sir Josiah John Guest, of Dowlais Iron works, Glamorgan, and Thomas Evans, same place, agent, *improvements in the manufacture of iron, and other metals*, Sept. 30.—Claim first.—The use or application of steam forced in contact with the melted iron, in puddling and refinery furnaces, for the manufacturing the same.

Claim second.—The use of steam in the process of melting and manufacturing alloys of copper and iron.

Claim third.—The use and application of steam to the fluid cinders to produce paste, and the use and application of the said paste.

Jets of steam are introduced into the ordinary puddling furnace, close to the iron while in a state of fermentation; the steam is to be generated in the chimney of the furnace, and is brought very near to the surface of the melted iron, by sliding telescope tubes made of wrought iron; the pressure should be about 15lbs. to the inch. During the above process, steam may be introduced upon the fluid cinders, until they become of the consistency of thick paste; then let the paste be applied with a rake to any cavities in the bridge, in order to keep the sides, back, or bottom of the furnace from being burnt; this will also be found to keep the iron quite clean and free from dirt.

In the refining furnace after the pig-iron is melted jets of damp steam should be introduced by the same aperture as the blast, through four pipes of half an inch diameter, with a pressure of 20lb. to the inch.

It is better for the steam here to be generated in the chimney of the furnace, but it may be used from a boiler, and is employed in precisely the same manner in melting and manufacturing alloys of copper and iron, and tin and iron.

ENTERED AT THE PETTY BAG OFFICE.

(Continued from No. 62.)

Charles Cummins, Leadenhall-street, manufacturer of chronometers, &c., *improvements in barometers and sypiesometers*, Oct. 2.—Claim first.—Method of registering the changes of the atmosphere by a barometer, by means of a magnet floating on the mercury, as hereafter described.

A magnet is enclosed in the glass tube of the barometer, so that it may float on the mercury contained therein. A socket of iron, or steel, encircles the tube; to one part of this socket is attached one end of a lever, which moves on a centre, and has at its other end a counterbalance weight, so as to prevent the socket from falling, yet allowing it to move more freely up and down, outside the tube containing the mercury, to the socket is also fixed a black lead pencil, or marker, which has a wire pressing it outwards, by means of a light spiral spring. Adapted to the above, and fixed in such a position as to allow the pencil to act upon it, is a card, divided by vertical lines into days or hours; this card is attached to a cylinder, connected to a time-piece, or other wheel-work, which will cause it to revolve regularly, so that the pencil will be continually marking, and on an alteration of the temperature, the mercury, with the magnet, will rise or fall, and causing the socket to follow, will produce a higher or lower mark on the card, the time of alteration being shown by the lines of division on the card. The inventor does not confine himself to the above-named arrangement of the lever, for regulating the motion of the socket, as the same effect may be produced by a weight and pulley.

Claim second.—Mode of obtaining a compensation for the changes of the temperature, so that the mercury may at all times remain at nearly the same elevation in the cistern.

This is effected simply by a sliding cistern, containing mercury, floating in a larger vessel, also containing mercury, and into which the lower end of the glass tube of the barometer descends; so that on the mercury descending that tube, it ascends the cistern, which thereby becomes heavier, and descends into the vessel of mercury, and thereby the mercury in the cistern remains at nearly the same elevation as before.

Claim third.—Mode of using the tubes of the sympiesometers with open ends, so as not to be compelled to use a cistern.

Claim fourth —The use of sulphuric acid, either diluted or not, or almond oil, as an enclosing fluid, in the tubes of sympiesometers.

NOTICE.

In accordance with the determination expressed in our 26th Number, of giving one month's clear notice to Inventors, before publishing their specifications, we hereby inform the following Patentees, that their specifications will be published in the "INVENTORS' ADVOCATE" of Nov. 21. Each party will receive, in addition, a *private* communication to the same effect.

Miles Berry, Chancery-lane, due Nov. 9.
Auguste Moinan, Philpot-terrace, Edgeware-road, due Nov. 9.
Rice Harris, Birmingham, due Nov. 12.
George John Newbery, Cripplegate-buildings, due Nov 12.
Henry Dircks, Liverpool, due Nov. 12.
John Davidson, Leith-walk, Edinburgh, due Nov. 12.
Peter Bradshaw, Dean, near Kimbolton, Bedfordshire, due Nov. 12.
James Walton, Sowerby-bridge, Halifax, due Nov. 12.
Richard Foote, Faversham, due Nov. 12.
Bryan l'Anson Bromwich, Clifton-on-Terne, Worcester, due Nov. 13.
Henry Ernest, Gordon-street, due Nov. 13.

FOREIGN INTELLIGENCE.

BELGIUM.

The commissioners of inquiry, appointed by the Chamber of Representatives, to inquire into the state of trade and manufactures in Belgium, and to devise some remedy for the depressed condition in which they are at present, has been prosecuting its investigations in the different manufacturing towns in the country; where they have examined the members of the Chambers of Commerce, and collected their varying opinions respecting the causes of distress, and the mode of removing them. In Brussels, however, the commissioners have met with some opposition from the Chamber of Commerce. The first summons to attend them was disregarded; the next summons only brought two or three members, but the Chamber sent a note representing the reason of their contumacy to be, that they objected to examinations of the individual members of the Chamber, and they recommended that any questions which the commissioners desired to propose, should be submitted to the Chamber collectively; in this manner its opinion would be formally obtained; whereas, by separate examinations of the members, the commissioners could only obtain the opinions of individuals, and such opinions would want the sanction of the Chamber as a body. The commissioners, however, would not submit to be dictated to in the manner they should conduct their inquiry. Several individuals of the Chamber, and some manufacturers, have since appeared before them to give evidence. At the last conference of this kind, the earthenware makers and the cotton manufacturers were the two branches that most loudly complained of the depressed state to which they were reduced. The former attributed their distress to being excluded from the foreign markets, by duties exceeding the value of their wares; and to being driven out of the home market by foreign competition. The manufacturers enforced the necessity of imposing a duty on the earthenwares of Luxemburgh, and a higher duty on those of England. The cotton manufacturers demanded either a prohibition of foreign goods, or (in opposition to the opinion of the Chamber of Commerce collectively) the imposition of an excise mark with the existing duties.

Delegates from the different Chambers of Commerce, in Belgium, have been invited by the Minister of the Interior to come to Brussels. These delegates assembled on the 28th and 29th ult., in the office of the Minister, at which meeting he presided. In the sitting on the 28th, the different branches of industry were taken into consideration and their actual condition stated. The questions of an excise mark and of differential duties formed the subjects of deliberation on the 29th. The great majority of the delegates were against the excise mark, and in favor of the system of differential duties recommended by the Brussels Chamber of Commerce, which is a mitigated differential system, consisting, in the first place, in maintaining the existing duties upon articles imported under foreign flags, and diminishing them when the articles are imported in Belgian ships: and, secondly, in establishing a duty of consumption upon goods brought into direct consumption, such as wines, coffee, dried fruits, &c., and granting a diminution of the duty on those imported under the national flag.

Professor Wheatstone, the inventor of the electrical telegraph which is now at work on the Great Western Railway, is at present in Brussels, where he has been trying the new improvements he has introduced in his apparatus. Mr. Wheatstone has succeeded in so simplifying his apparatus, that he has reduced the number of wires employed to two. They are covered with caoutchouc, and enclosed in tubes; the principal thing to be attended to, is to protect them from wet. The great objection which had been previously made to these telegraphs was the difficulty of repairing the wires in case any should be broken or damaged, as it was supposed it would not be possible to tell where the fracture was. This difficulty has now been obviated by means of a small carriage moved along the line of the telegraph. The place where the defect lies is indicated by a magnetic needle, which changes its position the instant it arrives at the part where the connection is broken. Professor Wheatstone conceives that it is possible to communicate with his apparatus between Dover and Calais. He has been repeating his experiments at the Brussels Observatory in the presence of many scientific men. We shall mention the results of these experiments in our next number.

The Belgian Government has determined to adopt a new kind of rail on their railways. These rails are heavier and will be more expensive than those at present employed. This attention of the Belgian government to the improvement of the form of the rail on their railroads is well worthy of imitation by the directors of the English railway companies.

RAILWAY INTELLIGENCE,
DOMESTIC AND FOREIGN.

PRESTON AND WYRE.—The passenger traffic on this line has greatly exceeded the expectation of those connected with it. When this undertaking was first projected, it was estimated that the number of passengers, including 20,000 by steamers to and from Ireland and Scotland, would be 37,043 per annum, leaving only 17,043 for the local trade; but since the opening of the line on the 16th July last, owing to the increased facilities of communication and moderate fares, upwards of 48,000 individuals have availed themselves of this route. It is expected, in the course of next spring, that steamers will ply regularly between Fleetwood and the Isle of Man, Belfast and Glasgow. Three years ago there were only two houses at Fleetwood, and the site of the town was a barren waste overrun with rabbits; now there are 103 houses inhabited to overflowing, and 54 in course of erection.—*Railway Times.*

RAILWAY TO DONCASTER.—A meeting was held at Swinton, on Friday, for the purpose of adopting measures for the formation of a railway connecting Doncaster with the North Midland. The Mayor of Doncaster presided at the meeting, and after a good deal of discussion, a resolution was unanimously passed to the effect,—"That a communication by railway, between Doncaster and the North Midland Railway at the nearest and most convenient point, would be attended with local and general benefit." It was further resolved, that as a matter of precaution, it was desirable to deposit an additional plan of a branch falling into the North Midland Railway at the Swinton station; and the engineers received orders accordingly. This alteration, it was stated, would not prevent an application to parliament in the next session.—The Mayor intimated that he should convene a public town's meeting on this subject on the 12th, and that at the meeting of the corporation, which stood convened for the 13th, he would report what had then transpired.

OPENING OF THE MANCHESTER AND LEEDS RAILWAY.—On Monday this important line of railway, which traverses the manufacturing districts of Yorkshire, and connects them with the wealthy and populous county of Lancaster, was opened to the public from Leeds to Hebden-bridge—a distance of twenty-seven miles. The distance from Manchester to Littleborough (thirteen miles) has been open more than a year; and the distance remaining to be completed is only about nine miles, which will be finished in such time as to admit of the opening of the entire line this year, and possibly in the course of next month. The North Midland Company, along whose line the trains run for ten miles, have engaged to work the railway at the Leeds end until the whole line shall be opened.

GREAT WESTERN.—The works of the Great Western Railway, in the immediate vicinity of Chippenham, are progressing in the most astonishing manner, and it is understood from the highest authority, that the line will be rendered complete by October, 1841. The accidents occurring on it are, however, very numerous, and require the greatest caution to be avoided.—*Bath Journal.*

NEW RAILWAY TO THE NORTH.—A new line of railway is about to be submitted to the public, commencing at Broxbourne, upon the Northern and Eastern Railway, and passing through Bedford and Market Harborough to Leicester; thence across to Tamworth by the proposed Trent Valley line, for the Liverpool, Chester, Irish and Scotch traffic, and along the midland counties to Derby; and thence by the Charnet Valley for the Manchester traffic. By this route the public will be tolerably independent of the London and Birmingham railway, and it will produce a wholesome competition for the traffic.—*Correspondent of the Sun.*

The Great North of England Railway, which extends from York to Darlington, will be opened to the public on the 25th of next month.

CONVICTION OF AN ENGINE-DRIVER.—On Saturday John Leonard, one of the engine-drivers in the service of the Great Western Railway Company, was charged before the magistrates at Slough, with misconduct. It appeared that the Railway Company, on the funeral of the Princess Augusta, on Friday, directed that an extra train should leave Slough at twelve o'clock at night. To that train the defendant was appointed, with the Leopard engine. At twelve o'clock the train started for Paddington, stopping on the way at West Drayton and Hanwell; but it did not reach its destination until two o'clock. In consequence of the delay, an inquiry was instituted, when it appeared that on the

defendant starting with the train from Slough he had with him on the tender of the engine four persons, which being contrary to the rules of the company, he was made to stop the engine and put them down. That put the defendant out of temper, and in consequence he retarded the train by every means in his power, allowing the steam to get low, and thereby occasioning a delay to the passengers of upwards of an hour and a quarter. The magistrates said that as this was the first case of the kind brought before them, and, in the hope that a conviction would operate as a caution to other engine drivers, they would fine him only 40s and costs, which the defendant paid. We understand the directors still retain Leonard in their service.

RAILWAY ACCIDENTS.

To the Editor of the "Inventors' Advocate."

SIR,—Perusing your remarks in your last number, respecting the various accidents on railroads from the engine and carriages getting off the rails, I have inclosed a sketch of two of my plans, which have been laid by for upwards of three years in consequence of the immense expense of securing a patent. Indeed, had I not read your remarks they would never have been brought forward again, thinking it perfectly useless to take out a patent and then run the risk of being ruined. The first plan consists in having two iron rollers under the engine, running within three quarters of an inch of the wooden rail, on each side 14 inches high from the ground. The second plan is a perpendicular iron roller in a channel in the ground, which I think objectionable on many grounds The first plan however, I feel confident must prevent the carriages from getting off the rails. I have a small model engine, and the ground plan of a railroad with the wood rail, and nothing can answer better. If my plans can he of any service, you are perfectly at liberty to make them known to the public. Although I am debarred from taking out a patent, in consequence of the great expense, I am not disposed to act the part of the dog in the manger. Your's respectfully, J. JONES.

Springfield Place, Sheffield, Sept. 29.

LONDON AND BIRMINGHAM.—On Friday forenoon a fatal accident occurred at Brent-hill, near Sudbury, in which David Donald, an excavator, through his own temerity, lost his life. It appears that about eleven o'clock some excavators, among whom was the deceased, were repairing the line at Brent-bridge, when a train being heard, they all, with the exception of Donald, got out of the way. He, however, continued on the line until it was too late. The fender of the engine knocked him down, and the train passed over him, crushing him most dreadfully. On Monday an inquest was held on the body, and a verdict of "Accidental death" was returned.

BLACKWALL.—On Monday morning, shortly after nine o'clock, a serious accident occurred, near the Poplar station, to a man named Paintner, who has been employed on the line since its opening. Paintner, whose duty it was to look to and oil the rollers over which the rope passes, had been frequently cautioned of his recklessness, in approaching so close to the trains during their transit. He has frequently boasted of his foolhardiness of "doing the thing to a shaving." He was on the line as usual, and the guard on one of the down trains perceiving, on approaching him, that he was close to the rails, sounded his horn, to warn him of his danger. With his usual foolhardiness, however, he kept his position, and the consequence was that the shearers, a part of the machinery used in catching the rope, struck him on the right arm, and instantly broke it. The unfortunate man received further injuries in his fall.

THE LATE ACCIDENT ON THE NORTH MIDLAND.—A letter from Mr. William Lister, who was a passenger in the train on the North Midland Railway on the 13th September, when the fatal accident occurred from the breaking of an axletree, has sent a letter to the papers which gives more particulars respecting it than have yet appeared. He expresses his astonishment at the verdict of the coroner's jury, who imposed no deodand nor passed any censure on the use of such imperfect ironwork. Mr. Lister says:—"The rate of travelling was upwards of 30 miles per hour. The concussion was exceedingly violent—immediately fell a carriage with a loud and awful sound, succeeded by another, then fell ours. I was thrown over the head of Mr. Jones, whose leg was broke, shortly before sitting next to me. As soon as I recovered, I felt anxious to discover the cause of the accident, which was conclusive on seeing the axle, which appeared too small in circumference, more than a tenth part of which was quite unsound—viz., black where broke, commencing from the outside. Such is the nature of bad iron—it is like marking glass with a diamond, which breaks only at the mark. So is it with iron when unsound, any concussion or extra pressure is certain to cause a separation. Seven carriages were thrown off the line, two, at least, were shivered to small fragments. Although the material of the carriages did not cause the accident, still I consider the wood, which appears white spruce fir, improper for carriages. In my opinion the accident would not have occurred, if there had been six-wheel carriages instead of four, as they tend to divide and lessen the pressure."

THE SAFETY OF RAILWAYS.—The last number of the *Railway Magazine* completes a list which it has made of the accidents on different railroads since their openings, with the number of passengers carried and the miles travelled. The following is a summary of the whole.—"We have now added to our list ten more railways, making in all twenty-four. In these ten lines, the miles run are 6,722,000, and the passengers carried 3,184,789, without any fatal accident fairly and justly attributable to the system. However, lest the railway opponents should have nothing to exercise their spleen upon, we make them a present of the two fatal cases—one on the Brighton and the other on the Croydon. The deaths by twenty four railways will then amount to four, the miles run to 262¾ millions, and the passengers carried to 17 millions. Speaking in millions but few of our readers can form any adequate notion of the smallness of the risk to railway travellers. We will, therefore, endeavor to set it in a more tangible shape. At the last census, the population of England, Wales, and Scotland, with the army and navy, amounted to about 16½ millions, including men, women, children, and infants. If, however, we take 12 years of age as the commencement of bustling life, the population is probably not more than 8 millions of that age and above, and the mean duration of life from that age is, in round numbers, 39 years. Therefore, in 83 years, there will be born and arrive at the age of 12 years 17 millions of persons in Great Britain, that is at the rate of 561 per day, reckoning 365 days to the year. Consequently, if any railway was to begin and carry every soul in Great Britain which arrives at the age of 12 years, at the rate of upwards of 561 per day, and carry them 15½ (which is the quotient of 262¾ millions of miles by 17 millions of passengers) miles per day, Sundays and all included, one fatal accident only would happen every 20¾ years!! and if those accidents only which are justly due to railways were considered, it would be but one in 41½ years."

ACCIDENT AT ST. PETESBURGH. — A letter from St Petershurgh, dated the 18th September, says;—"There has been a most terrible accident upon the railroad to Sarsks. It happened on Sunday. A great number of persons wishing to return from Sarsks to St. Petershurgh, an extra train was put on upon the line, the engineer undertaking to get to St. Petershurgh before the St. Petershurgh train should start from that city to Sarsks, there being only a single line of rails laid. The engineer, however, miscalculated, and the trains unfortunately met upon the road, the night being so dark that it was not discovered that they were approaching each other until the dreadful collision took place. The loss of life was dreadful. The engines were literally dashed to pieces, and such was the force of the collision, that three or four of the carriages, towards the hinder part, were thrown up one above the other, those of the front sharing the fate of the engines. The extent of the loss of human life is not correctly known. B—, whom I met on board the steam-boat in coming from Cronstadt, told me that a friend of his who was in the train and escaped dragged out six dead bodies with his own hands. *The superintendent and all the persons connected with the management of the railway are in prison.*"

FOREIGN RAILWAYS.

AMSTERDAM AND HAARLEM.——The first anniversary of the opening of the railway from Amsterdam to Harlem was celebrated at the Hague, on the 20th of September. The stations and the carriages were decorated with the national flags, and the directors gave an entertainment to the persons employed on the line, at which several appropriate toasts were drunk with enthusiasm.

TO CORRESPONDENTS.

GRATUITOUS COPIES *of our Journal have been forwarded to a number of Individuals interested in some Patent, or Invention, of which notice has been taken in our number of to-day.*

'THE INVENTORS' ADVOCATE" *is published every* SATURDAY MORNING, *at* 7 O'CLOCK; *if, therefore, our Subscribers do not receive their copies* regularly *from their Newsmen, the fault never rests with* US.

For the convenience of persons residing in REMOTE PLACES, *the* "INVENTORS' ADVOCATE" *will be regularly issued in* MONTHLY PARTS, *stitched in a handsome wrapper.* PARTS 1 *to* 15, ARE NOW READY.

ADVERTISEMENTS *should be sent in not later than* Thursday Evening.

TWO *numbers of the* "INVENTORS' ADVOCATE" *(Nos.* 48 *and* 49*) were published* July 4. *The former contoins, in addition to the usual varied matter, the* TITLE PAGE *and a* Copious INDEX *to the* SECOND VOLUME.

VOLUME II. *of the* "INVENTORS' ADVOCATE," *handsomely bound, is* NOW READY. *A* FEW COPIES *of the* FIRST VOLUME *still remain on hand.*

"F. H." *will receive full answers to his inquiries, if he communicate his uddress. They are of too comprehensive a character to be replied to in a notice to correspondents.*

"Forger."—*The account of the new paddle-wheel shall appear in our next.*

"G J." *may procure the information he requires by application at the Patent Office.*

*** *All letters for the Editor of the* INVENTORS' ADVOCATE, *are requested to be addressed to the Patent Office, British and Foreign, No.* 198, *Strand.*

TO CAPITALISTS, MANUFACTURERS, AND TRADERS.

Among many VALUABLE INVENTIONS *and* PATENTS *registered at the* PATENT OFFICE. BRITISH and FOREIGN, (198, STRAND), *for the investment of capital, Shares are offered for sale in the following Useful Inventions:—*

A Fire Escape of Novel Construction, which may be used as an Observatory.

A Cheap Lamp for burning Tallow and Grease, without overflow or smell.

Patent Screw Jack, for lifting locomotives and other great weights.

An Improved Balance, applicable to small or great weights.

Important Improvement in Wood Paving.

A New and Improved Method of Burning Coke.

New Methods of Purifying and Treating Oils.

Patent Forge Back.

A new Castor for Furniture.

TO INVENTORS.

PERSONS WHO WISH TO OBTAIN OR DISPOSE OF PATENTS, *or to bring* NEW INVENTIONS INTO USE, *are requested to apply to the* PATENT OFFICE, BRITISH and FOREIGN, No. 198, STRAND, *opposite St. Clement's Church, where they will meet with great facilities to obtain information and to carry out their views.*

THE GALLERY OF INVENTIONS,

Attached to the Patent Office, is a spacious Saloon, well lighted, in which Plans and Models are exhibited. It affords an excellent medium for bringing New Inventions into public notice.

THE
INVENTORS' ADVOCATE,
AND
JOURNAL OF INDUSTRY.

SATURDAY, OCTOBER 10, 1840.

*** *The Office for the publication of* The Inventors' Advocate, *is this week removed from Tavistock Street, Covent Garden, to the Patent Office, British and Foreign,* 198, *Strand; opposite St. Clement's Church.*

When the design and object of The Inventors' Advocate were announced, in our first number, we confidently anticipated that the plan we proposed, "to afford an efficient medium of communication between Inventors, Patentees, Capitalists, and the Public at large," would meet with encouragement. We have not been disappointed. Numerous as have been the difficulties and obstacles which must be necessarily encountered on the commencement of an undertaking which proposes to open new and extended sources of information, we have the satisfaction to find that our labors have been favorably appreciated; for testimonies of the value and usefulness of the Inventor's Advocate have multiplied upon us, from all quarters, in a manner altogether unexpected.

The exclusive information which we have frequently been enabled to communicate of the progress of scientific discovery abroad; the early and faithful record of the specifications of new inventions, and discoveries at home; the numerous original disquisitions on interesting questions relating to science and political economy; with the varied information on all subjects connected with trade, manufactures, literature, and the arts, to be found in our pages, may be confidently appealed to as justifying our claim to stand foremost in the rank of those periodicals devoted to the advancement of science and mechanical art.

Encouraged by the indications of public patronage already bestowed on the Inventors' Advocate, the proprietors have determined to make further exertions to extend the sphere of its usefulness, and to render it worthy the high character which, they are proud to say, it has gained in the scientific world. With this week's number they have commenced some fresh arrangements suitable to the present position of the work, and to the circumstances which have gradually made it desirable to give it a more scientific character. The space required for matters strictly within the objects of the Inventors' Advocate, will render it necessary in future greatly to abridge our notices of the Drama, and to limit our Reviews of Books to works of a scientific nature. We shall, by this means, be able to afford more room for the letters of correspondents: whose communications on subjects connected with the objects of our publication, we shall always be desirous to receive.

Arrangements have also been made for increasing our stores of scientific and mechanical information, and for rendering our Journal a more comprehensive record of facts and circumstances especially interesting to inventors, men of science, to manufacturers and capitalists.

For the connection existing between this Journal and the Patent Office, we refer to the article on our first page.

ON THE PUBLICATION OF SPECIFICATIONS.

To the Proprietor of the "Inventors' Advocate."

Sir,—In addressing you as the Proprietor of the "Inventors' Advocate," I have to complain of your publisher omitting to insert the Specifications according to the notice given; having anxiously looked for the last three weeks for Fahien's rotary engine, which has at last appeared in this morning's number. Mr. Elkington's valuable patent I see is not noticed.

I can scarcely suppose so respectable a firm as your's, would accept of a bribe to omit a specification.

I am, Sir, your's, &c.,
Taylor Cooper.

1, Liverpool-street, City,
Oct. 3, 1840.

We are obliged to the writer of this letter for his notice of the fact, that Specifications do not always appear in the "Inventors' Advocate," at the dates when they are due. It gives us an opportunity of inserting a few words of explanation on a point which we have long intended to clear up, for the satisfaction of those persons who take an interest in the publication of specifications immediately after they are enrolled, which forms so remarkable and novel a feature of our Journal. This practice has been much commented upon, in the way of condemnation and approval, and much virulent abuse has been heaped upon us by certain parties; we are therefore desirous of proving to the public that whilst we, on the one hand, act with strict impartiality, and by the previous notification of our intention to publish specifications do all we can to protect the rights of patentees,—we, on the other hand, fearlessly perform our duty, and are not to be intimidated by threats, or base insinuations of accepting bribes.

Various causes combine to prevent patentees from enrolling Specifications at the time they become due. It not unfrequently happens that the inventor, being a person of small pecuniary resources, is not provided with funds to pay the expense of drawing and enrolling his specification.

Sometimes he finds, when the time for enrollment arrives, that he has not brought his invention to that degree of perfection of which it is susceptible; and if he disclosed its principle before he had completed the details, he would be seriously compromising his rights.

Frequently the title to a patent is found to be bad, or not to be sufficiently comprehensive to cover the invention.

At other times, the progress of a rival patent for a similar invention, or the fear of injury to the patentee, by too early a disclosure of his invention, renders it expedient to keep it secret for a time.

Under any of these circumstances, the patentee is either obliged, or he deems it prudent to abandon his patent; and, if he can afford the expense, he takes out a new one.

Such cases often occur; there are other and accidental causes, which may prevent a specification from being enrolled, such as the sudden illness or unavoidable absence abroad of the patentee, at the very moment when one of the forms prescribed by law is to be complied with.

In that intricate maze called the passing of a patent, by one of the absurd regulations which seem to have no other object than to put fees into the pockets of officials, it is provided that the patentee must cause the specification of his invention to be enrolled "under his own hand and seal," to which he must make affidavit before a Master in Chancery.

If from the accidental causes we have noticed, or from any other, he is unable to comply with this regulation, no remedy is left to him. He cannot sign by power of attorney, or delegate authority to an agent or assignee to act for him,—he is imperatively required to sign the specification himself before a Master, or if he fail in so doing, his patent becomes void on the mere point of form of the want of his signature. Cases of this kind not unfrequently occur, and the hardship is very great.

Having explained that from various causes patents that have passed the Great Seal are frequently allowed to lapse, and that, therefore, we cannot publish the specifications of such patents, for the simple reason that they have not been enrolled—we have to add for ourselves, that from the great number of specifications which are sometimes enrolled at one time, it is impossible to keep pace with them in our weekly Journal, and we are often obliged to postpone the publication of some to a future number.

Such has been the case lately to a great extent, and the two specifications noticed by our correspondent have merely been delayed in that way.

Few of our readers have an idea of the mental labor, to say nothing of the expense, which the publication of specifications in our columns requires.

Some specifications are so absurdly drawn, and spun out to such an unconscionable length, that it requires no little ingenuity and patience to extract the really descriptive part from the professional and technical rubbish. We have lately gone through a specification filling 15 skins of parchment, and explained (!) by 14 drawings; the whole badly arranged, and almost incomprehensible. The specification might have been far more intelligibly drawn at one-third of the expenditure of asses' skin. But the charge for a specification is in proportion to its length, and it is a part of the vicious system of patent grants, that in the enrollment of a specification, all parties concerned have an interest to make it as long as possible, except the poor inventor himself who has to pay the expense.

Our attention having been drawn to this subject, we have to announce that for the future we shall give, monthly, a list of those patents of which the specifications have *not* been enrolled.

As to the supposition that we have at any time intentionally suppressed, or postponed the publication of a specification,—we hardly think it necessary

to say it is a charge without the slightest foundation; and we shall be obliged to any of our readers to inform us if any cases of omission have fallen under their notice.

COMPARATIVE DANGERS OF RAILWAY AND ROAD TRAVELLING.

The question of tho comparative safety of railway and of common road travelling has lately been mooted in the daily papers; with some unfairness on tbe one side, and with much interested zeal on the other. There can be no doubt that, taking the number of passengers carried, and the distances travelled, the accidents by railway have been fewer than those, on the same number and distance, conveyed by coach. But this is not the point to be considered; for it is no answer to a charge of neglect and want of care on railway managers, to assert that more accidents have happened by coach travelling. The object to he attained is the greatest amount of safety that each modo of conveyance affords, by taking proper care and by rendering availablo to the fullest extent the means which the present state of knowledge presents.

In railway travelling the principal sources of danger that arise from travelling on common roads are avoided. The accidents from the uncertain nature of animal power, and from coming into collision with other carriages or obstacles, are those of most frequent occurrence on common roads. These are, to a certain extent, almost inevitable from the circumstances of the case. It may also be stated, that the comparatively small number of persons conveyed in each stage coach makes it impossible to appoint men of a superior grade as coachmen to those usually employed; and the smallness of the number also diminishes, to the same degree, the importance of tbe trust. From these dangers, travelling by railway is exempt. The accidents arising from sudden jerks and strains produced by roughness in the road are also avoided by railways, and the lowering of the centre of gravity, which is easily attainable in railway carriages, also contributes materially to their safety.

Against all these advantages are to be placed the danger from the possible bursting of the boilers, and that arising, necessarily, from the greater rapidity of the motion. The first additional source of danger is almost nominal; for, since tbe introduction of tubular boilers, very few accidents have occurred from explosion. It is the rapidity of the motion which occasions the chief additional risk in railway travelling. This cause operates in two ways; by increasing tbe liability to accident, and secondly, by magnifying the calamity when accidents occur. These sources of danger exclusively incident to railway travelling are, however, greatly counterbalanced by the advantages we have enumerated. They are dangers also that in a great measure may be guarded against by proper care and by improvements in the machinery employed.

This should not be viewed as a question merely between stage coach travelling and conveyance by railway; the question is, have the managers of railways taken sufficient advantage of the additional means of security which railway conveyance, if properly conducted, affords? If they have not done this, they are chargeable with shameful neglect of duty even though the lucky chance has been theirs not to experience a single accident on their particular line. Any day such an accident may occur. The great possible extent of destruction to human life, by accident to a train of railway carriages, naturally causes more anxiety and awakens more public interest to the system of conducting this mode of conveyance, than to the appointments of isolated stage coaches, in which the numbers perilled are so few.

The anxiety to see this important means of internal communication placed on the basis of greatest security, may perhaps assume the appearance of hostility to railway managers, and to the system generally. We believe, however, that the hostility is confined entirely to the defects of the system, and not to the system itself. For ourselves, we can say, that though we have never hesitated to condemn, and strongly, the abuses which exist in railway management, to point out defects and urge improvement, we view the establishment of railways as a great national gain. We only regret that the advantages hitherto derived from them, and the security they are adapted to afford, have not been equal to their capabilities, nor to the well-founded expectations of the public.

Among our "Railway Intelligence" will be found the report of a case brought before the magistrates at Slough, of the conviction of an "engine driver" on the Great Western Railway for misconduct. The man, contrary to orders, took some friends with him on the engine tender, and when this infringement of orders was pointed out, and the men compelled to get off, the engine driver, by way of revenge, detained the passenger-train an hour and a quarter, at midnight, beyond the regular time. The circumstances of this case show clearly enough the class of men to whose skill, care, and good conduct, the lives of the passengers are entrusted. The punishment awarded for this wilful and spiteful act was not calculated to deter men of this kind from similar conduct, which might be the cause of accident as well as of inconvenience. The imposition of a fine of forty shillings was the punishment decreed by the magistrates; and the railway managers, even more merciful than they, having obtained his conviction, relented, and agreed to retain him in their employ. It is less against tbe conduct of the engine driver individually that we complain, than against the system of employing men of such a grade for the discharge of such important duties. The fact of the man being continued in his employment shows that he must he at least an average specimen of his class.

NEW INVENTIONS.

NEW APPLICATION OF WIND POWER.

We have seen, recently exhibited on the Thames a small boat fitted up with an apparatus intended to apply the power of wind in propelling vessels by means of paddle-wheels. In the centre of the boat is placed an upright shaft, to which four horizontal arms are attached. To these arms are fitted vanes to catch the wind, which open and close, somewhat in the manner of an umbrella. By this arrangement, each expanded vane that is exposed to the action of the wind is turned round, and kept expanded until it arrives in the opposite side of the circle, when tbe force of the wind closes it. As tho vane approaches its former position, the wind again blows it open; and by this contrivance, the horizontal arms are made to turn round. The upright shaft, which is thus kept revolving, communicates its motion to the axle to which the paddle wheels are fixed. The object of the invention is, to give the boat a direction varying from, if not contrary to, that of the wind; but it is manifest that an action in direct opposition to that of the wind cannot be gained by this means. As all the moving power results from tbe direct action of the wind on the vanes, the effect of that action is, to drive the boat before it; and all that could possibly be effected by the action of the paddle-wheels would be to counteract the power of the wind, and to keep tho boat stationary. There must necessarily be a great loss of power in communicating the motion from the upright shaft to the horizontal axle, and the difference between the amount of direct power on the vanes, and the counteracting power of the paddle-wheels, would serve to drive the vessel before the wind.

COMPRESSED AIR ENGINES AND CANNON.

Several distinguished engineers and other scientific men attended on Saturday to witness a series of experiments on compressed air, at the late establishment of M. Perier and Co., at Chaillot, Paris. The inventor of the various new and ingenious modes of applying this power, M. Andraud, a gentleman well known in the scientific and literary world, began by exhibiting a small carriage, which was set in motion by compressed air on a small railway laid down for the purpose. This carriage was moved up and down several times at the rate of about twenty-five miles an hour. The air compressed only to about 25 atmospheres, which is little more than one third of the power to which it can be compressed without danger of explosion, is contained in a proof cylinder or reservoir, which supplies the pistons in the same way as for a steam locomotive. M. Andraud states, that two of these cylinders are sufficient for the supply of a locomotive for about ten miles on a railway, and as air can be compressed almost without expense, wherever there is a stream or even a windmill to work the machinery, fresh charged cylinders can be kept ready at stations, and applied to the locomotive, this being the work of only one minute. The improvement in M. Andraud's air locomotive on all others which have been invented is in the application of a regulator, by which the air is supplied with unfailing regularity and certainty, and is under the full control of the engineer; and in the mode of dilating the air by heat, so as to effect great economy. In dilating air, it is necessary, for the purposes of locomotion, that it should he done very rapidly, for otherwise the speed cannot be kept up. It cannot be dilated in the cylinder or reservoir without great danger of explosion, and by the ordinary process only the external surface of the air immediately exposed to the action of heat is rapidly dilated, the internal molecules, air being a bad conductor, requiring great time for dilatation. M. Andraud gets rid of all this difficulty by passing the air through a very long spiral tube immersed in melted lead, and in this way the whole is dilated in the twelfth part of a second, and a reservoir of air thus dilated performs 5,000 strokes of the piston, whereas the same quantity of air undilated performs only 2,200. Another of the experiments was with an air cannon. Balls were thrown from it which, at a distance of 250 yards,

broke in the roof of a building, and lodged with great force in a wall, although the air was compressed to only 20 atmospheres. M. Andraud proposes that batteries in fortified towns shall be worked by compressed air instead of powder, the expense, where there is water power or wind to compress the air, being, according to M. Poncelet, only 1-75th of that of powder, and, if compressed by a steam-engine, 1-50th. Artillery may be worked in the same manner, for the horses, in drawing the guns to the field, would by the motion of the wheels fill all the reservoirs necessary for a long battle. The next experiment was on the power of compressed air in raising water, either for the supply of towns, or for the draining of marshes, mines, &c. By a very small apparatus, a column of water was thrown to a height of 75 feet.—*French paper.*—[The idea of compressing air by the revolution of the wheels of the carriage, is founded on an erroneous notion that the pistons of the air pumps can be worked by the turning axles without any exertion of power. The motion of the carriage would be retarded by the resistance of the compressed air on the pistons; and the power exerted by the horses would have to overcome that resistance before the carriages could move.]

IMITATION OF THE HUMAN VOICE.

We are informed by the *Fanal*, Brussels paper, that M. Glantz, one of the first mechanics of Vienna, has been at work for several years in forming an instrument, which his ingenious mechanism has at length succeeded in making imitate the sounds of the human voice. The instrument, it is said, is now completed, and that it acts in a manner altogether unexpected. It is stated to be a *chef d'œuvre* of mechanism. By pressing a spring, it executes different melodies in a tenor voice, a barytone, or deep bass. This wonderful instrument, it is furthermore added, excites, as it might naturally be supposed to do if the account of it be correct, the most lively sensation in the *salons* of Vienna. M. Glantz intends to make an automaton, in the head of which he will introduce his voice-instrument; the mechanism of which occupies very little room.

ROTARY ENGINE.

An engine, upon this principle, was tried last Wednesday, in Leeds, in the presence of several engineers. Its enormous power, in so small a compass, (the whole machinery, with the exception of the fly-wheel, being contained in a box 2½ inches in depth and 10 inches diameter) surprised every one present; the speed was tremendous, making from 600 to 700 revolutions per minute. Its power was tested by placing breaks upon the fly-wheel, which was done to the extent that the shaft was actually twisted in two pieces, but no accident occurred. It is the intention of the inventor to apply the machine to propel carriages on common roads, for which purpose it appears admirably adapted; likewise for the purposes of marine navigation, where the small quantity of room it requires is a material consideration; in short, it will answer all the purposes wherein steam is required; and the expense will be considerably abridged. The inventor is Josh. Briggs, watchmaker, of this town.—*Leeds Intelligencer.*

NEW PADDLE WHEELS FOR STEAM BOATS.

There is now exhibiting on the miniature canals of the Polytechnic Institution the model of a steam boat fitted up with Mr. Stevens's paddle wheels. It is well known that the common paddle-wheel is open to the objection of producing an incessant vibratory motion, which is occasioned by the floats lifting instead of propelling the vessel when they first strike the water, as well as lifting the water and depressing the vessel when they leave it. The wheel in question may be termed a mathematical propeller, every portion of it being a perfect mathematical figure, and is intended to obviate these inconveniences. The inventor says of it that "every float is the segment of a sector, and each coincides with the other throughout the whole circumference of the wheel, so that no one float interferes with or overlaps the other; and, by being placed upon radial areas, they are capable of being shifted into any position, and thus the just amount of propelling surface is duly apportioned to the powers of the engine, and the greatest effect produced."

SCIENTIFIC MEMORANDA, AND NOTES ON ART.

Meteorological Observations for August, 1840.—Sun shone out 27 days—Rain fell 15 days—Thunder one day—Wind, north west five days—East-south east one day—South east four days and a half—South seven days—South south west four days—South west eight days and a half—Variable one day—Calm 12 days—Moderate 11 days—Brisk five days—Boisterous three days.

Mean temperature of the month.....	57 deg. 60
Mean temperature of August, 1839.....	55 ,, 70
Mean temperature of spring water	52 ,. 33

Phil. Mag. October, 1840.

On the Solubility of Silica by Steam.—Mr. Julius Jeffreys, late of the Hon. E. I. C. Medical Establishment, communicated a paper to the Royal Society during the past session, giving an account of an experiment on the subjects of which the following is a digest: The inner surfaces of a flue built of siliceous bricks appeared to be deeply eroded by the passage over it of steam at a very high temperature, and fragments of siliceous materials laid in the course of the current were partially consumed. A siliceous crust was deposited on several vessels of stone-ware, coated with a micaceous glaze, placed in the upper part of the furnace, and this crust was re-dissolved when the vessels were removed to a hotter situation in the same furnace. The author noticed the experiments of Dr. Turner and others, which failed in showing the solubility of silica by steam, in consequence, as he conceives, of the heat not having been sufficiently great to effect the solution.—*Proc. Royal Soc.* 1839, 1840.

Chemical Analysis of Archil and of Litmus.—According to the recent investigations of Dr. Kane, read before the Royal Society, he finds in the lichen *Roccella tinctoria* the following bodies either pre-existing in the plant or formed during the process employed for its analysis. 1. Erythroline; 2. Erythrine (the Pseudo-erythrine of Heeren); 3. Erythrine bitter; 4. Telerythrine; and 5. Roccline (the Roccellic acid of Heeren). He finds the *Archil* of commerce to consist essentially of three ingredients, viz., 1. *Orceine*, 2. *Erythroleic* acid, and 3. *Azoerythrine;* of each of the two former there exist two modifications, and there is in addition a yellow matter. His inquiries into the constitution of ordinary litmus lead him to the conclusion that that substance contains the principles designated by him as 1. *Erythroline*, 2. *Erythrolitmine*, 3. *Azolitmine*, and 4. *Spaniolitmine;* and that the coloring constituents of litmus are, in their natural condition, red; the blue substances being produced by combination with a base, which bases in that of commerce are lime, potassa, and ammonia, and there is mixed up in the mass a considerable quantity of chalk and sand.—*Proc. Royal Soc.* 1840.

Substitute for Sulphur.—We recently noticed a method of extracting sulphur from various sulphates. It has been put into practice to some extent by extraction from pyrites in several manufactures. The *Gateshead Observer* says, "An oil of vitriol manufacturer] in this county has used nothing but pyrites since the close of last year, and finds it answers his purpose well: and there are extensive alkali establishments on the Clyde and the Tyne which abandoned the use of sulphur some time ago." Mundic can be raised and exported from Cornwall at about 20s. per ton, while the price of sulphur in the market is £12 per ton. We understand that 6,000 or 7,000 tons of mundic have been shipped this year from Cornwall to different parts of the kingdom, but 20 times that quantity will soon readily find a market.

Deposition of Moisture on Metals.—If we place, in an atmosphere saturated with humidity, a piece of polished zinc and a piece of tarnished lead in contact, when the temperature lowers, the lead becomes covered with dew, and the zinc remains dry without oxidising. It is thus with two different metals. The moisture settles on one only. If the effect be attributed to electricity we must conclude that the drops are electrified positively.—*M. Bonsdorf. Annales des Mines.*

Presence of Arsenic in Tin.—The greater number of the tins of commerce contain arsenic. I have found none, except the tin of Banca, and an English tin in lumps, which are exempt from it. The method of Marsh is perfectly adapted to show its presence. Dissolve from one half to one drachm of tin in concentrated hydrochloric acid, with heat, in a small glass bottle. Hydrogen gas escapes, which will not inflame immediately on account of the vapor of water and acid with which it is mixed. Collect it in a tube filled with water, and furnished with a stop cock, or otherwise connected with a pointed tube. Inflame the gas, and let the burning jet play against a piece of cold porcelain—the arsenic, if any be present, will be deposited, as it is well known, in the form of a black shining coating.—*Annales des Mines.*

Tunnel through the Alps.—A communication was made to the Scientific Congress of Turin, on the 24th ult., by General Rachia, of a plan for a new line of communication between France and Savoy, by a tunnel of several thousand yards in the Cottian Alps, the highest point of which would be about 700 yards below the level of the pass of Mount Cenis. "The magnificent rout of the Simplon is," says the *Commerce*, "in the meantime so neglected as to be almost impassable."

Golden Eggs.—The discovery of M. Jacobi, which consists in causing metals to be deposited on different bodies by galvanic action, has given rise to a singular mistake. A young philosopher by this process, covered over some eggs with gold, and sent them to the Academy of Limoges. The learned academicians were a long time in discussing the nature of the food, which could produce such an effect on the hens as to cause the phenomenon; and they concluded, by coming to the vote, that "the Jacobi" laid golden eggs. The secretary terminated the discussion, by expressing the wish of the Academy, that that species of hen might be introduced into Limoges.—*Le Fanal.*

Geometrical Survey.—The officers of the engineers appointed to conduct the survey of the island have been for the last six weeks stationed upon the top of Ben Volich, a high and peaked mountain in Rannoch, east of Lochgarry. They had spent the greater part of the summer on Schihallion, but the severity of the weather of late has both impeded their operations and rendered the station very uncomfortable. For the last fortnight the snow has been lying some inches deep around their very superficial temporary dwelling, and the carriage of fuel from the surrounding districts is at once expensive and precarious. The view from this mountain, as well as from Schihallion, is very extensive from their commanding altitude, and enables the engineers to take a very wide observation.—*Scotch Paper.*

Lead-Mine in Scotland.—We saw a few days since some fine specimens of lead ore from the property of Lord Lovat, in Strathglass. A party of workmen, engaged for the purpose from England, are now exploring the hills, and are sanguine as to ultimate success.—*Inverness Journal.*

The Grand Invention for Destroying Fleets.—The assertion that, before these inventions were offered to the English Government, "they had already been detailed to the French," is a falsehood; but we will communicate a curious fact to our readers, which will rather astonish them, but which is, nevertheless, most strictly true. An impostor made his appearance, ten days ago, at Paris; obtained access to M. Thiers, to whom he represented himself as the inventor alluded to in the *Times*, and had actually an audience of Louis Philippe. That acute-minded Monarch, with the test supplied by the statements in the *Times*, soon detected that he had not encountered the real man, and the charlatan was dismissed.—*Conservative Journal.*

Effects of Lightning.—During a recent thunder storm at New Romney, several persons were struck by lightning. The effects of the electric fluid are thus described in a local paper:—Mr. Miles was struck as he was about to wind up the town clock. The effect was a severe shock on his side, which turned him half round, and produced a sort of bewilderment of the brain; he describes it as being a mass of burning flame, which hung about him for some seconds, running down his arm to the keys and back again; he had no power to drop the keys, but clenched them still firmer: most miraculously the fluid left him without doing him any serious injury. He was perfectly ignorant how he got back to his home. On the same evening a female was also struck by the lightning. It took her across the eyes with such force as to deprive her of her sight. She has since been unable to bear the light. She describes the flash, after it struck her, as having dropped before her on the pavement with a hissing noise, and vanished; she had an umbrella up at the time, which probably attracted the lightning. A looker-on, who was out with some lambs, says, the lightning appeared to him more awful than any he had ever seen. He was leading his horse, when the electric fluid struck them back, but did them no injury; the dog crouched under the horse for protection, and the lightning curled round the lambs' legs, and their bodies were frequently enveloped as in a sheet of flame. We have heard that two men, on board a vessel in Dungeness Roads, were struck dead by the lightning.

VARIETIES.

Buttons Dispensed with.—A tailor, at Brussels, has taken out a patent of invention for ten years, for a new make of pantaloons; by which buttons, and of course button-holes, are entirely dispensed with. These pantaloons without buttons, it is said, are as easily adjusted and kept up, as those of the ordinary make.

Medical Instruction in London.—What is termed the medical session commenced generally in London on Thursday. Medical schools are attached to nine out of the ten hospitals in the metropolis, the only exception being in that of the Westminster Hospital, whilst two of the hospitals are attached to the two recognised colleges of the London University, in which the certificates from all the others are received. There are six schools, independent of the above, to which are associated the same number of teachers, who lecture on an equal number of subjects. There are altogether 15 schools, in which, on an average, 10 courses of lectures are delivered twice in the season, which terminates in May. There are upwards of 160 lecturers or teachers of the sciences connected with medicine, but few of whom are unconnected with schools, the number of which has increased since the establishment and incorporation of the University of London, whilst that of private teachers has diminished. As one alteration, it may be noted that no school is associated with any of the recog-

nised dispensaries. There are medical and scientific societies belonging to most of the schools connected with the hospitals, in addition to the other societies of older standing, which now commence their sittings for the session—viz., the London Medical Society, in Bolt-court, Fleet-street; the Physical Society, at Guy's Hospital; the Royal Medico-Chirurgical Society; the Hunterian and Harveyian Societies.

Dissolution of the Severn Navigation Company—A meeting of the shareholders of this company was held at the Guildhall, Worcester, on Tuesday last, to take into consideration the proposition to raise funds to make another application to Parliament for the improvement of the river. The business was opened by a statement to the effect that 1,026 shareholders had assented to pay an additional ten per cent per share; 160 had dissented, and the remainder had not sent any in answer. The chairman said that, considering the small number of shareholders who had agreed to pay the additional call, it was useless, in his opinion, for the company to continue its existence, for they could not apply to Parliament unless they had money. M. Pierpont, Esq., moved a resolution declaratory of the dissolution of the company. The resolution having been carried *nem. con.*, others were passed providing for the distribution of the company's property, and requesting the committee to associate themselves together, with power to add to their number, for the purpose of watching any opportunity that might occur for carrying the improvement of the river into effect—*Staffordshire Examiner.*

The Sulphur Trade.—Accounts from Palermo of the 1st of September state that much complaint is heard of the new duty of 20 carlins per quintal for the exportation of sulphur, which prevents commercial operations. Since the abolition of the monopoly the price of sulphur may be quoted at 18 tavi first quality, 16 second, and 13 the third, per quintal; adding to the above prices the duty for exportation of 20 carlins, the price will be 38, 36, and 35 carlins the quintal. It must be observed that the tavi of Sicily is of the same value as that of Naples.

Products of Java.—An interesting account of the products of Java has lately been published. The crop of coffee in 1839 was 750,000 piculs, of sugar 654.000, of indigo 676.000 lbs., and of tea 68,000 lbs. It was estimated that in 1840 the production would be 791,000 piculs of coffee, 719.000 of sugar, 745.000 lbs. indigo, and 133,000 of tea (the picul being equal to 136 lbs. English). All the produce of 1839 either has been sold, or will be, in the spring of 1841, and the quantity will have been 864,637 bags and 9,540 barrels coffee, equal to 800,000 piculs, and 474.740 baskets sugar of which 50,000 remain unsold, weighing about 730,000 piculs), 2,350 chests indigo sold, and 3,150 yet to sell, about 25.000 lbs. (Dutch) weight, and 2,314 boxes tea, about 68 000 lbs ditto. Value of the importations into Java in 1839 is less 800,000 florins than in 1838; and the exportation has increased 14,000,000 florins.

Conflict between a Steam-engine and a Donkey.—On Monday last, an unfortunate donkey, heeding not the notice to trespassers, had strayed on to the railway near to Hob-moor, at the time of the approach of a train; the engineer of which, seeing his critical position, gave him ample notice of their approach by the shrill whistle; but *Neddy*, being inclined to set at defiance his approaching foe, maintained his position until the engine neared him, when he turned round, and fired a volley with his heels at his iron-hearted antagonist, in doing which he was slain on the spot, the wheels running over his hind quarters.—*Yorkshireman.*

Lieut. Watson's Telegraphs.—A line of telegraph is being erected from St. Catherine's Point, Isle of Wight, *via* Southampton to London.

A Waterloo Bullet.—Mr. James Handford, of Langley, who was a private of the 1st Regiment of Guards at the battle of Waterloo, was shot on the eve of that celebrated Battle, in consequence of which he obtained his discharge and a pension. The ball was not extracted, and remained in a quiescent state till, a short time ago, a tumor appeared between his shoulders, which increased so as to render surgical assistance necessary. In probing the tumor, the ball was found by the surgeon. It had entered at the point of the left shoulder, and passing under the scapula was lodged in the middle of the back, close to the spinous process of the lower dorsal vertebra, from whence it was extracted last week. He is doing well.—*Derbyshire Courier.*

Earthquake—Further accounts have been received of the convulsion on Mount Ararat, by which it appears that the consequences have been far more fearful than the first announcement had given reason to apprehend. The town of Nakitchevan has been totally destroyed; all the buildings of Erivan more or less injured; and the whole of the villages in the two districts of Scharour and Sourmata have perished The cotton and rice plantations are all laid waste; but the immediate neighborhood of the mountain itself has been the scene of the most awful calamity. A huge mass slid from the mountain, overwhelming everything and person in its progress, for a distance of seven wersts (about five English miles). Amongst others, the great village of Akhouli has had the fate of Herculaneum and Pompeii, and above one thousand inhabitants have been buried beneath the fallen rocks. The mountain opened, giving passage to a thick fluid, which swelled into a river, and, following the same direction, swept over the ruins.

The Theatres.—Two of the minor theatres have opened their winter campaign since our last. The Olympic, under the management of Mr. Butler, opened with three new pieces on Saturday, each of which was successful. The Railways have been dramatised for the first time, in one of those lively sketches in which the incidents arise out of the peculiarities of railway travelling. The theatre has been fresh painted and decorated, and it now looks more like its former self; as the gallery has been reconverted into boxes. The Adelphi opened on Monday. Mr. Yates has made great alterations on the outside of his theatre, so that its external appearance may correspond with its importance among the minor theatres of the metropolis. The Adelphi company are nearly the same as last year, with the addition of Mrs. Yates, who is able again to appear. The novelties of the opening night, were "Robespierre," in which some of the horrors of the French Revolution were enacted, with the melodramatic effect so peculiar to this well-managed little house; followed by *The Flip-flap Footman*, in which Wieland and Mrs. Keeley are the prominent characters. It is almost needless to say of pieces brought out at the Adelphi, that they were successful.

REPORTS OF SCIENTIFIC MEETINGS.

BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

We last week brought the report of the general proceedings of the meeting of the British Association at Glasgow to a close, reserving the reports of the sections on Tuesday and Wednesday for our present number. In giving these reports we are necessarily obliged to limit them to the subjects of most general interest, and to confine them to the most prominent points; but we shall probably on future occasions revert to some of the papers, either for the purpose of giving them at greater extent, or as the materials of comment.

Tuesday, Sept. 22.

Section A.—*Mathematics and Physics.*

A report by Sir John Herschel was read by the Secretary, detailing the progress made at the various Observatories throughout Europe and America on the subject of Magnetism; and the results seemed to be highly gratifying. In the course of the conversation which followed, the Astronomer Royal stated that Government had sanctioned magnetical observations at Greenwich, on an extended scale.

Dr. Lamont of Munich gave an account of the steps taken there for the purpose of prosecuting magnetical observations, the Government having forwarded the views of the British Association, by erecting an observatory for the purpose, which, to secure an equable temperament, was 13 feet below ground, and lighted by mirrors reflecting the light admitted by a cupola window. He also gave a statement of the progress of magnetical and other physical observations in the observatories of Bavaria.

Professor Jacobi, from the Academy of Science of St. Petersburgh, read an elaborate detail of numerous experiments made by him to determine the laws which regulate electro-magnetic phenomena, and illustrated these laws by the formula derived from the results. In the conclusion of his paper he stated that by means of machinery, which he was ready to explain privately, he had succeeded in propelling a boat twenty-five feet long, seven feet broad, drawing 2½ feet water, and containing fourteen persons, at the rate of three miles an hour, by means of electro-magnetism, the force produced being equal to five-sixths of one horse power. This was accomplished by a battery of 64 plates of the area of 36 square inches each.

Mr. W. Bald read a paper on the subject of the tides in the Clyde, at the harbour of Glasgow. Of the first series of observations, extending to 158, the mean rise and fall of the tides of the harbour was 6 feet 7 inches, while in 1755, Smeaton stated that tide to be only sensible at Glasgow Bridge. A most elaborate section was exhibited of the rise and fall of the tides for each tide of the 1200. The velocity of the tide in the Clyde exhibited a strange result. The velocity of the tidal wave from Port-Glasgow to Bowling was at the rate of 14.56 miles an hour; from Bowling to Clyde Bank it was only 6.82 miles an hour, probably arising from the curves in the river; while above Clyde Bank on to the harbour, the velocity of the wave was 10.85 miles an hour.

Professor Kelland read a paper on the Conducting of Heat, in which he noticed the theories of Newton and of Fourier, and considered the former was erroneous, while the latter was the correct one.

Dr. Anderson read a long paper on the Meteorological Observations made at Perth and at Kinfauns; and Sir D. Brewster gave an account of the increase of colors produced by inverting the head so as to look through the legs or under the arm at a landscape. This arose, in his opinion, from the additional blood pressed into the vessels of the eye by the inversion of the head. Sir D. then made some remarks on the improvement of Polarising Microscopes.

Section B.—*Chemistry and Mineralogy.*

Dr. Thompson, President of the Association, read a paper on the Minerals of Glasgow. The author, during the reading of the paper, exhibited specimens of an immense number of the more generally known, and of several recently discovered minerals. The places where each of the specimens was found, and the constitution of the various minerals, were fully noticed and explained. Amongst those shown were beautiful specimens of the mineral lately found at Bishopton, and termed Greenockite, which is so very scarce, that a small crystal is valued at £10. The author, when these specimens were first shown him, thought they belonged to an entirely new description of mineral, but he had since learned that it had been known amongst dealers in minerals in Glasgow for the last ten years.

The next paper read was by Dr. Buchanan, "On a method of separating the Coagulable Lymph from Liquid Blood by filtration." The author's mode of obtaining the fibrine of the blood, was by collecting the serum drawn from a person the day before; and to every six or eight parts of the serum so drawn to take one part of liquid blood, and filter it afterwards in a peculiar way. It would be found, he said, that the fibrine was very much more than was generally supposed, for instead of 1000th part it would be found to be one or two per cent.

Professor Clark explained a new method of detecting minute quantities of Arsenic.

Professor Gregory brought before the Section Professor Bunzen's new mode of estimating Nitrogen in Organic Analysis.

The papers subsequently read were:—On the Quantity of Carbonic Acid evolved from the Lungs in health, and in some forms of disease, by Mr. M'Gregor; Professor Redsenbacher and Dr. Varrentrapp on the Constitution and Products of Distillation of Fat Acids; on a new Salt obtained from Iodine and Caustic Soda, by Professor Penney; on the general Constitution of Resins, and on some varieties of Peat, by Professor Johnston.

Section C.—*Geology.*

Mr. Lyell called attention to the discovery of the *conus concarus*, the *conus cadonemis*, &c., in the lias formation of Forbaine, near Caen, by the French geologists, showing that these fossils occur in older strata than the tertiary.

The Duke of Argyll called the attention of the Section to specimens of veins of copper ore found in Argyllshire. Specimens of this ore had been discovered several years ago, and after an investigation of the district, it was found in such quantities, and of such quality, as to induce him to adopt measures for working it, and arrangements for this purpose are now in progress. Similar specimens had also been found in the island of Isla, on the estate of Mr. Malcolm, of Poltalloch, and various other places of Argyllshire, although Mr. Malcolm had never discovered the veins to which the ore belonged. There was granite in the neighborhood of the veins he had mentioned.

Mr. Lyell remarked that copper ore generally occurred in the neighborhood of large massea of granite, and that especially was the case with the silver ore in Norway, which uniformly occurs where the granite pierces the gneiss in veins.

Mr. Milne added that the same conjunction occurred at Strathearn and Lorhdon, where copper ore was found in the neighhorhood of granite.

Dr. Buckland showed specimens of the gold of the district, placed in his hands by the Duchess of

Argyll. These were antique Celtic clasps and bracelets, referable to a very early state of the civilisation of the country.

WEDNESDAY, SEPT. 23.

SECTION B.—*Chemistry and Mineralogy.*

The first paper read was by Mr. Bryson, "On the Refractive Powers of minute Mineral Crystals." The author's investigations on this point show that the refractive powers of Greenockite are only surpassed by the diamond.

The second paper read was by Mr. Espy, "On the Causes of the daily fluctuations of the Barometer."

The next paper read was by Dr. Gregory, "On the Preparations or Alloxan and Alloxantine."

The next paper read to the section was by Professor Jacobi, "On the mode of engraving in relief upon Copper by means of Electricity." The author entered into a lengthened explanation of the manner in which he proceeded in his experiments, and exhibited a great number of specimens of the engravings, which excited much interest in the section. After M. Jacobi had finished his statement,

Mr. Spencer, from Birmingham, rose and claimed the right of priority of discovery in this mode of engraving. Mr. S. made a number of statements, for the purpose of showing that he had brought the art to a state of comparative perfection in January, 1839, and communicated the discovery to several gentlemen in Liverpool; while the specimens exhibited by M. Jacobi to the British Association in Birmingham, last year, were extremely imperfect.

Professor Jacobi stated that he had published the discovery on the 5th of October, 1839, and insisted that this fact clearly established his claim to the priority of the invention.

The Chairman said the public looked upon the priority of publication as establishing a claim to priority of discovery; but he had no doubt that both gentlemen had made the discovery quite independent of each other.

Professor Gregory and other gentlemen gave similar opinions, and the conversation dropped.

SECTION G.—*Mechanics.*

Sir John Robison in the Chair.

The Rev. Dr. Patterson read a paper on the improved life-boat. The principles of it are explained as follows:—A Life-boat on a new principle was exhibited by the Rev. Dr. Patterson: he calls it a riddle life-boat, and it is his own contrivance. The reason of the name is that the bottom of the boat is like a riddle; and the characteristic property of the boat is, that it cannot fill with water, as the waves get out as fast as they enter the boat. The sides of the boat consist each of a hollow elliptical tube, to be made of sheet iron, and from this it has all its buoyancy, which is unaffected by any influx of water. This boat will be light, easily propelled, and will draw only a foot or two of water—it may pass through the most dangerous surf with perfect safety; and besides being used for reaching vessels in distress, or carrying passengers to steam-boats, it might be itself carried as a ship's boat in voyages—to be ready for use in dangerous or difficult landing.

Mr. Thomson, on the part of Mr. Grime, gave additional remarks on an improved wrought-iron locomotive wheel. Mr. Vignolles and other gentlemen took part in the debate which followed.

The Chairman then called the attention of the section to Mr. Clarke's exhibition of the extraordinary power of an electro-magnet, on a gigantic scale.

Mr. C. W. Williams introduced to the Section the subject of the prevention of the generation of smoke in steam-engines and other furnaces. A short debate followed, but nothing of moment was elicited.

Mr. Thom read a paper on an improved Rain Gauge, which was followed by another on the filtration of water.

The proceedings in the other sections on Tuesday and Wednesday, were not of sufficient general interest to make it desirable to report them in our Journal. The business of the Association, as we last week stated, closed with the general meeting in the theatre. In the evening, a numerous party of the distinguished visitors were invited to a public dinner by the Provost and Corporation of Glasgow. The manufacturers of the city and its neighborhood exhibited a very narrow-minded and illiberal spirit, by refusing to throw open their manufactories to the inspection of the members of the Association, as had been done by the manufacturers of Birmingham and other places where the association previously assembled.

ON THE OBLIQUITY OF THE ECLIPTIC, AND TRANSITION OF THE POLES.

To the Editor of the "Inventors' Advocate."

SIR,—Allow me again to observe that Lieut. Morrison is evidently wrong in supposing that I had mistaken the question, as there was no question in the case, consequently I could not have committed the error attributed to me (page 173), as the paper alluded to (page 158) on the Obliquity of the Ecliptic and Transition of the Poles, was merely a statement of my own opinions on the subject, in corroboration of the theory of Laplace, and which was sent to the *Uranian Society* before Mr. Saull's paper on the subject was read!

I contend, however, that the climates on our planet may have been very different from what they are at the present time, without admitting a motion of polar transition.

There appears pretty good evidence from geological observations, that the surface of the earth has been broken up at some remote period or periods; in all probability at the Deluge. The surface of the earth being covered with water must have caused a great reduction in the temperature of the earth and atmosphere, as the internal heat of the earth in all probability extended nearer to its surface, and would in consequence irradiate a greater degree of heat than at the present time.

Whereas, on the other hand, animals have been found frozen up in ice, in northern climates, covered with hair and wool, indicating a cold climate, and had their *skeletons only* been found, they might have been supposed to have been inhabitants of warmer regions.

It appears probable that some tremendous catastrophe took place antecedent to the creation of man, which destroyed the race of Iguanodons, and other gigantic reptiles. The very circumstance, however, of the upheaving of the Andes, the Alps, the Pyrenees, Himala Mountains, &c., including whole continents in which they are situated, and the submersion of others, arising from causes so stupendous and extensive, that changes of climates are consequent results from the effects of such causes. A transition of the poles would, undoubtedly, account for a successive variation of climates on the earth's surface, but it would by no means account for the entombment of the various animals, &c. which have been found embedded below the earth's surface, as the motion of transition of the poles would be too slow and uniform. For taking the period of transition at 2,500,000 years, and the earth's circumference at 25,000 miles, it is evident that if the waters of the ocean followed that of the transition of the poles, they would only pass over the *one hundredth* part of a mile in a year, or less than two inches per day, in advancing from the poles towards the equator, and *vice versa*.

Whence I consider the cause, whatever it might be, that effected their entombment, might also at the same time effect an alteration in the climate, without any reference to polar transition.

I, therefore, again repeat that I consider the *oscillatory* motion of the obliquity of the ecliptic to obtain according with the theory of Laplace; whose theory of the planetary perturbations have been all found actually to subsist. I can therefore see no reason why his theory of the *oscillatory* motion of the obliquity should be discarded.

I am, Sir,

Lynn Regis, Oct. 5, 1840. Yours respectfully, J. UTTING.

MUSEUM OF ECONOMIC GEOLOGY,

CRAIG'S COURT, CHARING CROSS, LONDON.

(*Extract from the President's Address of the Geological Society of London.*)

Among the most important of the remarkable events of the past year, we recognise with gratitude and confident anticipation of great advantage, both to science and the arts, the establishment by her Majesty's government of an institution hitherto unknown in England, namely, a Museum of ECONOMIC GEOLOGY. This is to be freely accessible to the public at stated periods, in the department of her Majesty's Woods and Forests, and Public Works, for the express object of exhibiting the practical application of geology to the useful purposes of life. In this Museum, a large store of valuable materials has already been collected and arranged, chiefly by the exertions, and under the direction, of Mr. De la Beche. In it will be exhibited examples of metallic ores, ornamental marbles, building stones and limestones, granites, porphyries, slates, clays, marls, brick earths, and minerals of every kind produced in this country, that are of pecuniary value, and applicable to the arts of life. Information upon such subjects, thus readily and gratuitously accessible, will be of the utmost practical importance to the miner and the mechanic, the builder and the architect, the engineer, the whole mining interest, and the landed proprietors. The establishment will contain also examples of the results of metallurgic processes obtained from the furnace and the laboratory, with a collection of models of the most improved machinery, chiefly employed in mining. A well-stored laboratory is attached to this department, conducted by the distinguished analytical chemist, Mr. Richard Phillips, whose duty it already is, at a fixed and moderate charge, to conduct the analysis of metallic ores, and other minerals and soils submitted to him by the owners of mines and proprietors of land, who may wish for authentic information upon such matters.

The pupils in this laboratory are already actively employed in learning the arts of mineral analysis, and the various metallurgic processes.

A second department in the Economic Museum, will be assigned to the promotion of improvements in agriculture, and will contain sections of strata with specimens of soils, sub-soils, and of the rocks from the decomposition of which they have been produced.

To this last-mentioned collection, proprietors of land are solicited to contribute from their estates labelled examples of soils, with their respective sub-soils; and all persons who wish for an analysis of any sterile soil, for the purpose of giving it fertility, by the artificial addition of ingredients with which nature had not supplied it, may here obtain at a moderate cost, an exact knowledge of its composition, which may point out the corrective additions which it requires. This portion of the Museum will more especially exhibit the relations of geology to agriculture, in so far as a knowledge of the materials composing the sub-strata may afford extensive means of permanent improvement to the surface.—*Phil. Mag., October*, 1840.

GERMAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

At the time when the attention of men of science in this country is directed to the proceedings of the British Association, at their annual meeting at Glasgow, the following description, by M. Jacquemin, of the German Scientific Congress, will be read with interest:—

The German Scientific Congress is a grand and noble association. It unites all Germany at a common centre, where Bavarians, Prussians, Hanoverians, and Wirtemburghers are no longer distinguished from one another, but all become children of Germany. That vast empire, which its situation at the centre of Europe, the fertility of its soil, and industry of its inhabitants, render so

powerful and so rich, has, nevertheless, for centuries past laboured under a most serious evil—the great division of its territory and interests. Indeed of one and the same nation it forms twenty different nations, connected by no link and no sympathy. To enter and to leave each of those states men and merchandise have a new duty to pay. The genius of science was the first to break through those barriers, sixteen years ago, by creating an association, whose members are everywhere—from the Rhine to the frontiers of Russia—from the shores of the Northern Sea to the mountains of Switzerland—an association which has no other boundaries than the very boundaries of the German nation.

To promote the progress of science, to form a holy league, every member should make the rest enjoy the result of his labours and discoveries—such was the object proposed. At first objections and doubts arose; apprehensions were entertained of its assuming a local impression, adopting a narrow system, and its succumbing before a thousand obstacles arising from the rivalry of so many petty states. But when it was seen successively transferring itself to Vienna, Berlin, Stuttgard, Bonn, and Prague, to the north as well as the south of Germany—wherever, in short, the German language is spoken, a noble idea was found to animate it, and, as it were, a scientific patriotism to be its foundation. Then also its members increased in numbers from year to year, and arrived from all quarters. The meetings everywhere attracted general attention; every city eagerly sought the honor of receiving the learned congress, and of throwing open to it its museums, schools, university, and manufactures. The Governments displayed the same zeal, and proved also that they honored science and learning.

Thanks to the liberal statutes of the scientific congress of the German naturalists and physicians, every literary man, whatever his age and rank may be, has a right to a seat in it. Therefore it is that a host of scientific men and friends of science flock to it from all parts; all arrive almost at the same time, and the few days they spend together are days of happiness to them. The love of knowledge, a pure and disinterested one, animates them and makes brothers of them all, though they have never known one another. This is a fine and gratifying sight. Venerable and experienced men, advanced in years, are seen placing at their head young men of ardent feelings, to guide them in the field of discovery; and both gain by it—the former satisfaction, the latter experience. Such is the real character of the German Scientific Association; its mission is a moral one, its object to extend social enjoyment. We shall even say—and no German will contradict us—that in the present social condition of Germany it could not aim at any other object.

The association depends upon none of the Governments to whose territory it successively sojourns; it depends solely upon the nation. All Germany has her eyes fixed upon it, because Germany wishes all those scientific men who belong to her, and of whom she is proud, to let other nations know the interest she feels in the progress of science and civilisation. They have this year worthily responded to her wishes. The association has been reproached with producing too little in the eight days which their meetings last. There is some cruelty in this reproach, or those who make it are entirely unaware of the situation of a *savan* in Germany. Would you deny men who remain all the year round nailed to their chairs or amidst their books eight days of recreation? Behold how plainly, how shabbily even, they are dressed. Do not fancy that it is only to conform to national habits. In Germany matters do not fare as in England, France, Russia, Sweden, or Italy. Literary fame procures there neither high office nor favors. Often even have the widows and children of the most celebrated men in science been obliged to part with the libraries and collections obtained by their departed relations at so great pains. They enrich science, but science does not enrich them. Do not, therefore, grudge the few days of pleasure every year yields them.

Besides, if they assemble at this or that place from all parts of Germany, it is not with a view to bookmaking; books enough are, God knows, to be found at the Leipsic fair; neither is it to make any wonderful discoveries; the sciences do not grow like mushrooms in a night; they are not reared in a hothouse by artificial means; to develope themselves, to reach maturity, they require air, freedom, and time. What scientific men seek for in these meetings is that repose which refreshes both the mind and the body, and whence fresh ardor and strength are derived. The German Scientific Congress is sometimes compared with that which it has suggested in England. They are two things essentially different. The British Association can dispose of large sums—it distributes and pays for scientific investigations—it is to England a complement to her academies and universities, which are not sufficiently numerous. In Germany it is an association of scientific men and friends to science, which is every year composed of other members, and has neither funds nor a location.

It must not, however, be supposed that at these rendezvous, which the German naturalists and philosophers thus give one another every year, their only object is to procure recreation: most of their time is devoted to scientific discussions; but those discussions are, at the moment, profitable only to those who have given rise to or participate in them; it is at a later period only, when they have passed the crucible of meditation, that they can become useful to the public. It is, therefore, ridiculous to expect that, on its very first dawn, those meetings should produce striking results. The whole German nation is interested in the association; the towns contend for the honor of receiving it; princes throw open to it the gates of their palaces; every where, in short, *fêtes* and acclamations attend it. On my return from Badenweider (for I, also, had the pleasure of attending the last meeting which took place at Friburgh) I found the whole road, even the smallest villages, illuminated. Cries of "Long live the naturalists!" "Long live the philosophers!" were every where raised; they came from the hearts of the people, for the people in Germany understand what is done for them, and love men of learning as much as they revere them. After witnessing the *fêtes* given by the city of Friburgh to the members of the scientific congress, and the inauguration of Guttemburgh's statue at Mayence, it is impossible for me not to like the German people, for it is on those two occasions that I have been enabled to know and appreciate them.

If we examine the general tendency and direction of the German naturalists and philosphers, we at once perceive that each has selected a special branch whence he does not seek to depart.

It may be safely affirmed that every shade of philosophy had its representative at Friburgh. The German will penetrate to the very depth of things, and stops only when he has discovered the final cause. Medicine marches abreast with physics, chemistry, mineralogy, and all the other natural sciences, which perhaps were never so far removed from quietism as at the present day. What predominated at the scientific meeting at Friburgh was individualism; every member had his own opinion, and maintained it openly, with ardor and deep conviction.

The number of scientific men assembled this year at Friburgh amounted to 526; among them were Frenchmen, Englishmen, Danes, Dutchmen, Italians, Hungarians, Wallachians, and Russians. Several had attended the meeting held at Pruntrot, by the French geologists, between the 6th and the 10th of September, and that of the Swiss naturalists, held at Bale, between the 12th and 15th of the same month. A large number of Baden philosophers whose general assembly had taken place, on the 12th, were also to be seen, at Friburgh.

It is curious to observe how the German association has increased from year to year since its establishment. At the first meeting, held at Leipsic, in 1822, there were only 15 members; at Halle, in 1823, 38; in 1824, at Wartzburgh, 37; in 1825, at Frankfort-on-the-Main, 88, in 1826, at Dresden, 115; in 1827, at Munich, 166; in 1828, at Berlin, 458, of whom 195 were of Berlin itself; in 1829, at Heidelberg, 273; in 1830, at Hamburgh, 412, of whom 154 were of Hamburgh and 67 from Denmark; in 1832 (there was no meeting in 1831 owing to the cholera raging at Vienna), at Vienna, 462, of whom 226 were of that city; in 1833, at Breslaw, 273; in 1834, at Stuttgard, 540, of whom 86 were of that city; in 1835, at Bonn, 484; in 1836, at Jena, 370; in 1837, at Prague, 373; lastly, in 1838, at Friburgh, 526, 54 of whom were Frenchmen, and 72 Swiss.

ADVERTISEMENTS.

Mining Journal Office, 37, New Broad-street, City, 27th June, 1840.

NEW WORK ON THE IRON TRADE.—The Number of the MINING REVIEW this day published, contains the Sixth Part of the Paper on the IRON TRADE, by Harry Scrivenor, Esq.—this work will be completed in Twelve Monthly Parts, and so arranged as to form a separate volume at the end of the year; in addition to which the MINING REVIEW contains—A Paper on the Establishment of a School of Mines—On the Ventilation of Mines, by Samuel Moyle, Esq., C.E.—On the Preparation of China-Clay, by W. J. Henwood, Esq., F.R.S., &c.—On Blasting Limestone Rock, being an Account of Blasting the White Limestone in the Country of Antrim, Ireland, by William Bald, F.R.S.E., M.R.I.A.—On the Applicability of Peat to Manufacturing Iron—Parliamentary Returns of the Imports and Exports of Copper, Lead, and Tin, for the year ending 5th January, 1840—Scientific Bodies, &c.—The MINING REVIEW is published at the office, as above, on the 1st of each month, price Sixpence.

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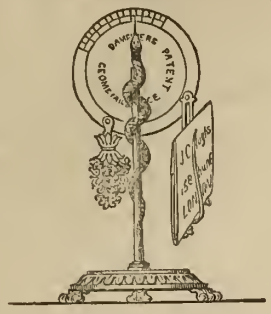

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THE

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AND JOURNAL OF INDUSTRY;

A WEEKLY BRITISH AND FOREIGN MISCELLANY OF

SCIENCE, INVENTIONS, MANUFACTURES, & ARTS.

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STEAM NAVIGATION.

One of the difficulties to be overcome on entering a new career of discovery, or in the new application of a known scientific principle, is to remove the clog of old associations, and to view the new invention or adaptation apart from all connection with systems and machinery which were formed and adapted for another state of things. It is by stopping short in carrying out the principle of a new invention to its full extent, or rather by endeavoring to adapt the principle to existing machinery and modes of operation, instead of making new machinery and contriving new methods fitted to the improved principle of action, that many useful and ingenious inventions are rendered of little avail, or fail to be so generally appreciated as their capabilities merit.

We lately alluded to this Procrustean system, which would cramp a valuable improvement by making it conform to old machinery and former modes of action, when we proposed a different plan of steering steam-ships from that now in use. We then endeavored to show that by taking advantage of the power of steam to give the vessel increased acceleration, on one side or the other, a much greater effect might be produced in steering, and much more conveniently, without the loss of power that must result when the guiding force depends entirely, as at present, on checking the motion of the ship by means of a rudder. It was by a rudder that sailing vessels had been always previously guided, and, therefore, that plan was adopted in steam-boats, without considering whether the new method of propelling did not likewise afford a new and improved mode of steering. We shall now proceed to consider what we conceive to be a still greater and more prejudicial example of marring the effects of improvements by attempting to make the application of a new principle subservient to old methods of operating.

Placing out of view, for the present, the different modes of propelling vessels by steam power—whether by the application of the Archimedes screw, by common paddles, or by the propellers that have been suggested as improvements on the paddle wheel—we shall now confine our observations to the form of ships adapted to steam navigation, and to the consideration of the causes which have hitherto prevented steam-ships from attaining a velocity corresponding to the power employed. Let us then, in the first place, reflect for a moment on the object proposed to be attained in building a sailing vessel, and then determine whether the same principle of construction is necessary for, and adapted to, vessels propelled by artificial power.

In sailing vessels it is not rapidity of motion alone that is required; but the power of sailing in a direction contrary to that of the wind must also be obtained. The vessel must, therefore, have a "hold" on the water, to prevent it from being carried sideways to leeward. This must be effected by making the length of the vessel much greater than its breadth and of such a shape that it will either sink deep in the water; or, by a very broad keel at the bottom. A keel is also a necessary protection against the effect of sudden gusts of wind. A long narrow ship cannot be moved sideways without greater force than a broad and short one, consequently it may be made to sail much closer to the wind. It therefore appears, that sailing vessels must necessarily be built in a form to *cut through* the water, and not to glide over it: or they would lose the power of moving otherwise than as the wind blows. If a vessel must cut through the water, the longer and narrower it is the more quickly will it sail, because there will be a smaller surface presented at the head to the resisting fluid. But in adopting a new system of propelling vessels, we should consider whether the same plan of ship-building which was suited to the moving power of wind is equally well adapted to the employment of artificial power; and whether the disadvantages necessarily attendant on the use of a precarious and variable moving force might not be obviated when a power altogether under control is employed.

We shall at once perceive from the foregoing considerations that the different conditions of the two powers must render a different system of ship-building necessary. In steam ships there is no necessity to provide for sailing against the wind, as the power employed is independent of and can be made to act in direct opposition to it. It will appear, therefore, from this view of the subject, that as the navigation of steam ships does not require the same provisions as sailing vessels, they may be constructed entirely with a view to rapidity of motion. The shape by which this can be best attained is found by experience and by reasoning to be that which will enable a ship *to glide over* and not *to cut through* the water. All notion of cutting through the water should, therefore, be altogether abandoned in the construction of steam ships; and they should be made of such a shape as to enable them by the velocity of the motion *to rise out of the water, and glide along its surface.*

The experiments made with the canal passage-boats in Scotland and the North of England prove that by increasing the rapidity of the motion the obstruction to the progress of the boats diminishes instead of increasing. The result of these experiments was at first quite incomprehensible, as it appeared to be in direct opposition to the well established law of resistance to bodies moving through fluids; according to which the resistance should have increased in a quadruple ratio to the increase of velocity. It was found, however, that the cause of the diminished resistance was, that the boats were actually raised out of the water by its reaction on the shelving bottoms of the boats, and that when moving at the rate of ten miles an hour they rose over the wave at the head, which, at a speed of six or seven miles an hour added a considerable resistance to their progress. Had the boats been built for the purpose of taking advantage of this principle of reaction, there is no doubt the effect would have been still greater. The passage-boats on the Goole and Nottingley canal, where similar experiments were tried with like results, have two keels, for additional security against tilting over; and they are, therefore, very badly constructed for taking advantage of the elevating power given by increased velocity.

If this principle in the construction of steam ships which we are now recommending were adopted, we have little doubt that the speed of steam ships might be very materially increased. The swiftest boat at present on the river Thames, and we believe also the swiftest in Europe, is the Eclipse; which during the season was performing its passage to and from Margate on the same day. The speed of this vessel, which is an iron one with little draft of water, is, in favorable circumstances, eighteen miles an hour. This speed, however, is in our opinion obtained, not by any peculiar fitness in the shape of the boat to the work it has to do, but by the amount of steam power compared to the mass moved. The Eclipse is worked by one engine of 120 horse power, and is not one hundred tons burden. The Duchess of Kent, Ramsgate steam-boat, which is one of the fastest after the Eclipse, is more

than double the tonnage, and has only twenty horse power additional; yet the difference in the speed of the two does not exceed half an hour in a distance of 90 miles. The fact is, the Eclipse is a narrow vessel which cuts through the water, and the increase of speed is checked by the increased ratio of resistance. Were it constructed on the principle of gliding over the surface, the increase of velocity would actually *diminish the resistance*, and the great amount of power compared with tonnage would produce its due effect.

Steam navigation is at present quite in its infancy, and yet has already effected wonders. When a better system of constructing vessels adapted to this mode of propelling them is pursued we anticipate results still more astonishing. We see no limit to the speed that might be attained, on still water, and instead of steam navigation being, as at present, in the rear of railway travelling, we expect that in a few years time it will take the lead; and that steam ships, having no collisions to dread, no obstacles to fear, no defects of rails to guard against, may be able to attain a speed even much greater than can safely be allowed on railways.

COMBINATION OF STEAM AND WIND POWER.

The obstacles which have arisen in Belgium to the establishment of the proposed communication by steam-ships with the United States has caused attention to be paid to the combination of wind with steam power, for the purpose of diminishing the expense and of dispensing with the necessity of employing such large ships and such powerful engines as would otherwise be requisite. An article on this subject is published in a recent number of *L'Emancipation*, in which the writer alludes to some successful experiments made in France, particularly with the *Veloce*, which has been fitted up on a new plan for the purpose of combining more effectually the use of sails with the propelling power of steam. In this article, the greater portion of which we have translated, the writer forms a comparison between the voyages of the *Veloce* and those of the *Great Western*, in which he endeavors to show that the former, with an engine of only 220 horse power, made quicker voyages, and consumed, in proportion, much less fuel, than the *Great Western*. In this comparison, however, he takes it for granted that eight days are required at New York for taking in a fresh supply of coals alone; and he assumes that the *Great Western* would not be able to carry out a sufficient supply of fuel to take her to the Havannah, the place to which the voyages of the two ships are compared. It is evident, however, that these calculations are founded on erroneous assumptions, and that he does not take into consideration the difference of tonnage of the two ships. The principle, however, is good, and whether the use of steam can be advantageously dispensed with or not during the times the wind is favorable, it seems at all events desirable that greater use should be made of wind power on sea voyages by steam-ships than at present. *L'Emancipation* observes:—

"We think that before undertaking to build immense steam-engines, it would be well to make very strict inquiry as to the experiments which have been tried in French navigation to combine the power of steam with the action of the wind. Perhaps in this new method, some means would be found of reducing the original cost, and particularly the expense of working. A steam-ship lasts a long time. If in the present day we were to construct it on the principles that are now in use, we should be obliged for a length of time to make use of a vessel whose construction would appear to us the more imperfect from being compared with those combining the recent improvements. When the question is to construct anything intended for long duration connected with an art that is every day improving, we should adopt the highest perfection, the most improved state of this machine or apparatus, that we may be as little as possible behind the progress of the art when our machine grows old.

"It is in France that the first attempts to combine in the same ship the actions of steam and sails have been attempted. The first attempt appears to have been attended with brilliant success. The principal persons who engaged in this undertaking were M. Hubert, director of the arsenal at Rochefort, and M. Bechameil, the captain of a cutter. Both have obtained authority to make trial of their systems on particular vessels. Each of these individuals appear to have made experiments of this invention almost at the same time, so nearly indeed, that it is difficult to determine which of them has anticipated the other in the conception of his project. It appears that the ideas and plans of M. Hubert are anterior to those of M. Bechameil, but that the latter officer has the precedence in the practical execution of his system. The ship which has been constructed by M. Bechameil, and on which he has adopted his own arrangement, is the *Veloce*, the quick voyages of which ship last year entitled her to the name. The ship built according to the principle of M. Hubert is the *Caméleon*. The latter vessel is not finished, and has not yet been submitted to trial.

"There is a secondary point which has required from the enterprising officers of whom we have spoken a long and complicated study. In a steam ship the draft of water changes as the quantity of coals on board diminishes; consequently, when sails are used, the height of the masts require altering. According to the plan of M. Bechameil, this alteration is made with promptitude and ease. This difficult point once overcome, nothing remained but the arrangement of some details. The steam-engine of the *Veloce* is of 220 horse power. This vessel has been compared to the famous English steam-ship, the *Great Western*. The engines of the latter are of 500 horse power, and their dimensions are, in general, greatly superior to the *Veloce*. But the latter vessel will certainly be large enough to accommodate passengers and to embark the merchandize conveyed from Belgium to the United States.

"The *Veloce*, commanded by Captain Bechameil, left for France on the 9th of December, 1838. It was the worst season of the year; she accomplished the voyage from Rochefort to Havannah in less than thirty days. The violent contrary winds she experienced off the coast of Cuba, made no perceptible alteration in her progress. She regularly proceeded at the rate of three leagues an hour. Since this time, the same ship has taken longer voyages on the coasts of the United States, on the coasts of France, and across the ocean. All these voyages have been equally successful. It may then be said that the great achievement thought to be impossible—the application of the two powers of steam and wind—has been completed. The results of the voyages already undertaken are such as to make the success of other voyages certain.

"In order to demonstrate the commercial utility of this system of navigation, we must prove that there is a saving of time, or at least a saving of expense in the combination of steam and wind. Let us first examine the question of time.

"The voyage of the *Veloce* between Rochefort and the Havannah has been compared to the navigation of the *Great Western* between England and the same American port. This comparison is apparently to the disadvantage of the *Veloce*. The *Great Western*, has the reputation of being the first steamer in Great Britain. The French ship, on the contrary was a frail structure, whose mode of sailing being subjected to new experiments, could not be provided with the usual accommodations.

"Notwithstanding these disadvantages, the comparison is entirely in favor of M. Bechamiel's vessel. The *Veloce* was twenty-eight days and a half in going from Rochefort to Havannah; a day lost must be added in waiting at Cuba, for pilots through the old passage to the Bahamas. Thus the voyage of the *Veloce* was accomplished in twenty-nine days and a half. In the same season, the *Great Western* was fifteen days in going from England to New York. She is obliged to stop eight days for a fresh supply of fuel, for the consumption of coals is too great to allow of her returning directly. The voyage from New York to Havannah occupies seven days, of which one day must be added for waiting for pilots. The total length of this voyage is then thirty-one days.

"It has then been shown, that the whole time employed by the two ships in making voyages of the same length is nearly equal, though the advantage is still on the side of the French vessel. It is not to be doubted, that the economy of fuel is greatly in favor of the latter vessel, for it is with the sole object of realising this economy that the use of sails and steam is united. On the *Great Western*, the coals employed in the first part of the voyage, that is, from England to New York, is about six hundred tons, and from New York to Havannah three hundred tons. The coals burnt by the *Veloce* between Rochefort and Havannah was only two hundred and ninety tons. The comparison between the consumption of the two vessels is nearly as three to one. The economy of fuel then would thus be two-thirds. But we must not forget that the steam engines in the *Great Western* have twice the power of those of the *Veloce*, therefore we must not estimate the saving of fuel at more than about one-third.

"The principal saving derived from the combination of the two powers of wind and steam more effectually is, that when the wind is favorable the steam power need not be employed. The experiment has then succeeded. The combination of a steam engine and sails on the same vessel is henceforth an acknowledged fact, an acknowledged advantage.

"We are not yet sufficiently acquainted with the construction of the *Caméleon* to decide which of the two plans is best; M. Bechameil's or M. Hubert's. It is probable that a short time hence, experiments made on an equally large scale, will enable us to decide this question. However it may be, is it not evident how greatly it must be to the advantage of the company entrusted with the management of the steam navigation between the Belgian ports and New York, and to the government also, to adopt a system which promises a saving of fuel of thirty per cent?"

PROFESSOR WHEATSTONE'S ELECTRICAL TELEGRAPH.

We mentioned last week that Professor Wheatstone had been exhibiting, at the Brussels' Observatory, his recent improvements in the electrical telegraph, which he has now simplified to such an extent, that two wires only are required to complete all the ordinary communication. We now give a description of the experiments exhibited, translated from *L'Independant*, a Brussels paper. The writer, after alluding to the discovery of the electrical telegraph, and to the extent to which it has been applied in England, on the Great Western and Blackwall railways, proceeds to remark:—

These first remarkable effects have not yet been obtained three years, and very important improve-

ments have already been introduced in the apparatus. We were enabled to judge of them by the experiments made by Professor Wheatstone himself, the day before yesterday, in one of the rooms of the observatory, in the preseuce of the English Minister, Lord Seymour,; Baron Falck, Minister of the Netherlands; General Bugen, Minister of War; General Evain; Colonel Chapilie, Commander of the Military School; Messrs. Verhulst, Froidmout, &c.

The explanations of the learned philosopher were so clear, and his instruments so simple, that it would perhaps be possible for us to give a very correct idea of the system, did we not fear to disclose what is not yet laid before the public; we will only say, that every thing which takes place approaches the marvellous. Let us imagine a series of small vessels (in the apparatus which we saw there were six, and the size varies according to the electrical power required), half filled with an amalgam of zinc, surrounded by sulphate of copper, and counected with thin strips of copper; to which apparatus two copper wires are fixed. These two wires issuing from this little portable battery are connected on one side by a very small circular plate of metal fitted with magnetic needles, each corresponding to a letter of the alphabet or a cypher; on the other by a kind of clock spring acting on a plate reproduciug the same signs. Everything depends, as we have stated, on two wire conductors. For three years, the power of operating with five wires was considered wonderful; Mr. Wheatstone has now so simplified his instruments that two only are necessary. The finger must be placed betwcen two needles opposite the letter required, and it must be turned till the finger is stopped by a needle placed transversely, and instantly without any perceptible interruption, the letter that has been indicated presents itself on a fixed dial by the rotary motion of the corresponding plate. It is not only 30 letters in a minute that can be thus obtained, but 40, 50, or even 60; and the chances of interruption are infinitely less, since there are now only two wire conductors instead of five.

If the two instruments be separated, and placed at the distance of a league, of ten, of twenty leagues, or more, the result will invariably be the same; because the knowledge of its action is sufficiently determined to be able to calculate with the greatest accuracy what electric power is lost by transmission. In the experiments at the Brussels' Observatory one of the wire conductors was carried round the room, and attached to a large bobbin of wire, many hundreds of metres in length. The electrical fluid follows all these windings, and the wires are kept quite separate, being covered with cotton. At other times the wires are covered with *caoutchouc* to preserve them from damp.

In this apparatus, still more wonderful on ac count of its simplicity, all practical difficulties have been anticipated and the means of obviating them provided for. For instance, at the moment of transmitting a despatch, in case the observer placed at the corresponding station should be asleep or inattentive, an alarm is given. The alarum is a hammer which strikes suddenly and forcibly on the bell of a clock; we may form some idea of the loudness of the noise, as it is heard at a distance of 700 or 800 metres. The alarm sounds so long as that by the transmission of the same signal, the observer who is addressed may be warned to be at his post.

It might chance that either by a disarrangement in the wires, or by a too rapid movement, the communication between the two indicatiug plates might be interrupted, as there is the same point of departure for every despatch and every word therefore, a spriug put in motion indepcndently of the electric action replaces the dial in the right place.

This is not all, for the science and genius of man have no longer any determinate limits. Mr. Wheatstone proposes, and what he has accomplished induces us to credit its possibility, to attach an apparatus to his telegraph, by means of which the despatch will be printed at the time of its arrival, that is to say, that it will transcribe itself.

We have said that two applications of electrical telegraphs have already been made very useful in England on railroads. It appears to us that similar results might attend the application of them to our railways, and doubtless Mr. Wheatstone will not leave Brussels without summoning the engineers to judge how wonderful are the certain and exact results that he obtains Besides, the expenses of the establishment are inconsiderable, particularly if it is recollected that the multitude of intermediate stations that other telegraphs require are not wanted by this. And if, which is not improbable, they should eventually be established between the principal commercial towns, between towns the centre of great financial operations, farewell to couriers and pidgeons, they will be for ever laid aside; even the common telegraph will be in disuse, and a whole nation of speculators will not be agitated by the anxiety respecting the prices of foreign funds, nor have occasion to wait the result of a despatch interrupted by night or by fogs.

MEMOIR OF LAVOISIER.

(*Concluded from our last.*)

In 1791, Lavoisier brought out his "Treatise on the Agricultural Riches of France," which the Constitutional Assembly ordered to be printed at the expense of the state. After these details, which it would be easy to enlarge if this were the place for doing so, are we not authorised to say that Lavoisier, as a public man, as an administrator, has nobly maintained his position, and that he has deserved the applause of his country? And if he did not neglect any of the duties of his office of *fermier-general*, can the philosopher be reproached with having failed in his mission? The answer is anticipated by the result; but it will perhaps be desirable to examine with some precision the manner in which he accomplished it. It has been seen how unbounded were the resources of this great man when circumstances required it. Take the volumes of the Academy of Sciences for 1772 and 1786, and they will be found to contain at least forty papers relating to the establishment of his theory. Lavoisier, during this time, was taking a part in all the committees of the Academy, and had to draw up all the most difficult reports. To the chemical investigations that circumstances required, he devoted himself as though his mind were quite unoccupied, and with equal ardor to the most easy as to the most complicated, to the most agreeable as well as to the most disgusting.

At the same time that he was apparently absorbed in experiments necessary for the establishment of his theory, at the time when his ideas on heat iuvolved him in a series of delicate investigations, we behold him engaged on a work, which perhaps no modern chemist would undertake. His object was to investigate the nature of the gas produced by corrupt excrements, of the gas which escapes from sewers. The object was to discover some means of assistance for the unfortunate workmen who so frequently lose their lives, suffocated by this deleterious gas, or are burnt in consequence of its unexpected explosion.

Well, Lavoisier, *fermier-general*, and very rich—Lavoisier, who considered every moment stolen from the investigations that his theory required as a robbery committed on his reputation,—Lavoisier, with his usual tranquillity and perseverance, devoted himself to a long series of experiments on this subject; so disgusting, that I should not have courage to euter into the least detail. They continued many months, and Lavoisier was impelled to devote himself to this revoltiug study, solely from feelings of humanity; for he could hope nothing from their success, but being the means of saving the lives of some unfortunate men. When his experiments were finished, he gave an account of them with perfect simplicity, as though that sublime charity which had aroused his attention had ennobled the subject, or spared him all the disgusts consequent on his long undertaking.

The activity of Lavoisier as a philosopher was unequalled. During fourteen years, the memoirs of the Academy continued to be enriched with some of his writings, distributed unequally, it is true; for there are some years when they are very numerous, and others when Lavoisier apparently reposed. Thus the year 1777 abounds with his memoirs; in the years 1781 and 1782, they are still so numerous that the volumes of the Academy cannot contain all, and we find it stated:—"This year M. Lavoisier has presented so many memoirs, that it is impossible to publish them all." The collection of his memoirs amounts to no less than eight volumes; no chemist had hitherto labored so much as he had done, and if he has not labored more, alas! the reason is well known.

I have now to perform a very mournful task,—I have to announce in what manner a life so valuable and so excellent was suddenly terminated. No idea can be formed of the emotion experienced, when, after perusing, as I have done, the memoirs of him who is the honor of France, when after tracing step by step the progress of that existence so devoted to science and to public good,—I repeat, no idea can be formed of the overpowering emotiou experienced on opening the work on which he was engaged at the time of his death. His theory was then complete, but in order to present its fundamental principles to posterity, it was necessary that it should be recapitulated. This necessity had become more imperious than ever, for at this time, in consequence of one of those vicissitudes, of which we have more than one example, the theory of Lavoisier was no longer that of Lavoisier, it was that of the French chemists. The nomenclature was confounded with the discovery of facts and the invention of ideas that it represents. Thus Lavoisier, after having had the originality of his theory called in question, saw it afterwards escape from his hands, and a portion of it claimed by all the chemists of his time.

He then conceived the idea of making a collection of his memoirs, that the public might have the means of judging if that system belonged to him or not.

But at the very time when he was engaged in this publication, death, a dreadful death, interrupted the progress of his pen,—and this unfinished collection remains the most affecting memorial to be met with in the history of science. There cannot be a subject of more melancholy coutemplation than this work. Only the second volume is complete; the first and the third, in preparatiou for the press, seem to be cut off by the same axe that struck their author! The sentence is interrupted at the very place where his pen was when he was seized by the executioners. I repeat it; no emotion can equal this; there is not in the world anything more dramatic than the sight of those funereal pages, of those unfinished lines, whose continuation is concealed from us by a bloody veil.

How did this event happen? How came it that Lavoisier, after so excellent and honorable a life, was lead to the scaffold by the horrors of the French revolution? Alas, it is easily explained.

Lavoisier was a *fermier-general*; and as such he was implicated in the proscription that involved them all. He was aware of his danger, but at the very moment when death hovered over his head, he still continued his labors,—he continued, he hastened, the printing of his works with a tranquillity, a serenity, worthy of ancient times; perhaps he thought himself removed from danger, and that his reputation was such as to require some reasonable pretext for his impeachment. Fatal confidence! no pretext was wanted.

On the 2d of May, 1794, a member of the Convention, named Dupin, formerly secretary to his father in-law, brought before that assembly an accusation of all the farmers-general. A few days afterwards, the report was read, changed by Fouquier Thinville into an act of impeachment by the revolutionary tribunal.

Lavoisier was put upon his guard; he learnt that his life was in danger; he was told that he was on the point of being arrested. Cruel moments! what was to become of him? what was he to do? Not daring to return home, a wanderer in

that Paris, where he could no longer beg a shelter, where he dared not accept one, for death followed his steps.

He accidentally met with a man of generosity; old Lucas, of the Academy, and of the Jardin des Plantes. Lucas took Lavoisier with him, and concealed him in the Louvre, in the most retired apartment of the secretary of the Academy of Science, which was already destroyed. Affecting circumstance! as if the Academy that Lavoisier had rendered so illustrious, suddenly becoming reanimated by the danger which threatened his life, opened her bosom to shelter her beloved, or at least to receive the solemn thoughts of his last hours.

Lavoisier passed one, or at the most two days in this retreat; he learnt that his colleagues were arrested, that his father-in-law was arrested also. He no longer hesitated; he tore himself from the asylum that had been opened to him, and went to resign himself a prisoner. He was condemned to death on the 6th of May, and on the 8th of May he ascended the scaffold. The tribunal, if it is allowable thus to profane the name, the tribunal did not hesitate a moment; by the tribunal, Lavoisier was only considered as a cypher. It was not Lavoisier they condemned, it was the *fermier-general*; it was perhaps this unexpected indifference to him, which caused his ruin. Others, by active exertions, had escaped similar dangers; but he and his friends were unable to imagine that the reputation with which they were so sensibly impressed, would not have influence with their judges; they were mistaken.

He, like all his colleagues, was condemned on the most puerile pretext—at that time no other was requisite—the sentence was "condemned to death for being convicted as the author or accomplice in a plot which exists against the French nation, tending to favor the enemies of France; particularly for using all kinds of violence and extortion upon the French nation, and mixing water with tobacco and other ingredients injurious to the health of the citizens who use it." In the fermentation of tobacco, it is necessary to add a certain quantity of water, and it was because an excise officer asserted without any proof, that too much water had been put in, that the farmers-general were condemned to death.

It has been said that after Lavoisier was condemned to death he demanded a reprieve on the plea of finishing some important experiments, and that this respite was refused; this appears doubtful.* Lavoisier died as it was then usual to die, with calmness and resignation; he died at the same time as his colleagues, and under the same impressions which had induced him to share their captivity.

There are some people who will say,—"Yes, the death of Lavoisier was an abominable crime, a public misfortune, but philosophy at least has lost nothing; his system was completely finished; he would thenceforth have lived in repose." Alas! this consolation, however insufficient it may be, is wanting.

The theory traced by Lavoisier is unquestionably established, and it will long continue to engage attention, and to provoke discussion; but far from being exhausted, his genius appeared more vigorous than ever, and his hand would sportively have raised the chains which he has forged for us.

Read his works, and it will be seen that Lavoisier projected concluding his experiments on heat produced by the combination of bodies; that there he has announced his intention of applying with assiduity to the study of affinities, on principles peculiarly his own; that elsewhere he alludes to a great work on fermentation, a work which was finished, but of which only a small part is transmitted to us. Read his works, and sorrow will refuse all consolation, for there will be found this announcement:—"This is not the place to enter into details on organised bodies; I have intentionally avoided it in this work, which has prevented me from entering on the phenomena of respiration, of sanguinification, and of animal heat. *Some day I intend resuming these subjects!*"

* It is asserted that when he asked for a reprieve, the ferocious Dumas replied: "The Republic has no need of philosophers or chemists."

ENGLISH EXPIRED PATENTS.

THEODORE JONES, of Coleman-street, London, accountant, *an improvement on wheels for carriages*, Oct. 11.

SPECIFICATIONS.

ENTERED AT THE ENROLLMENT OFFICE.

(Continued from page 230.)

RICHARD BEARD, Esq., Egremont-place, New Road, *improvements in printing calicoes and other fabrics*, Oct. 6.—These improvements consist of a complication of small parts, and would not be understood without the assistance of drawings; we shall therefore confine ourselves to the claims, simply alluding to the manner in which they are applied.

Claim first.—Mode of constructing a printing cylinder, with all the relief or printing parts moveable, so that all those parts to receive the same color are brought together for that purpose, and then dispersed over the surface of the printing cylinder in their proper places, according to the pattern.

This is effected by sliding bars, springs, &c., in connection with a guider or inclined plane, in such a manner as to cause the shifting parts of the cylinder, that are to receive the same color, to range round the cylinder, to receive their color from their proper endless blankets, or any other suitable surface, and then, by the action of the guider, they are removed to their proper positions on the surface of the cylinder.

Claim second.—The mode of constructing a printing cylinder, so that the printing parts may be made to approach or recede from the centre of the cylinder.

The printing parts, in this portion of these improvements, are formed by the ends of sliding bars, by which ends the pattern is composed; each one is moveable, and entirely independent of its neighbor. They are retained in a position, yet allowed freely to slide inwards and outwards, by means of bosses adapted to the cylinder for the purpose. These bosses have slits or openings in each, which serve as guides to the bars, so that if the machinery be properly arranged, a revolution of the cylinder will cause each bar to project when it arrives opposite its proper color, and continue to remain prominent until it has passed its color, when, by a motion of an eccentric near the centre of the cylinder, it moves inwards, and other bars become prominent.

Claim third.—The mode of procuring cast metal surfaces on printing cylinders.

This is effected by having a plate or sheet of zinc, one-sixteenth part of an inch thick, through which the required pattern is punched. It is then placed in a suitable mould, and melted metal poured into it, so as to fill up the places just punched out. When cold, the face is polished, or smoothed off, and an acid applied, which destroys the zinc sufficiently to cause the other metal to form a proper printing surface: it is then ready for use.

ENTERED AT THE PETTY BAG OFFICE.

(Continued from No. 63.)

HARRISSON BLAIR, of Kearsley, Lancaster, manufacturing chemist, and HENRY HOUGH WATSON, of Little Bolton, Lancaster, chemist, *improvements in the manufacture of sulphuric acid, crystallised soda, and soda ash, and the recovery of a residuum, or residuums, that may be applied to various useful purposes*, Oct. 6.—Claim first.—The application of a residuum, for the purpose of manufacturing sulphuric acid and soda, whether the same be manufactured by the decomposition of sulphate of soda, or by the use of carbonaceous matters.

The lime used in the purification of coal gas, is taken from the gas works after it has been used in the purifying process, (and therefore reckoned of no value,) and spread over an iron floor or bed, which is heated by a fire underneath, to rather a low degree of redness. A stream of atmospheric air is caused to pass over its surface; which should be repeatedly changed by means of a rake, or in any other convenient manner, thereby subjecting all the sulphur contained therein to combustion, which then passes off into a leaden chamber, as sulphuric acid gas, from which sulphuric acid may be obtained in the usual manner, or in an improved manner as hereafter described. After the lime has been deprived of all its sulphur, it is reduced to a state termed by the inventors, "calcareous residuum," which will be found serviceable, and may be used in a similar manner to any of the calcareous earths. It may also be used as a substitute for limestone in the manufacture of soda, either in a state termed crystallised, or as soda ash.

Claim second.—The application of heated iron pyrites, or refuse iron pyrites, with aqueous vapors or hydrogen gas in the production of sulphuretted hydrogen, to be used in the manufacture of sulphuric acid.

One mode of which is, to cause a continuous stream of steam to pass over iron pyrites, or refuse iron pyrites, heated to a red heat and confined in an iron retort or other suitable vessel, so as to exclude the atmospheric air. If made in this manner, it will be accompanied at the commencement by sulphuric acid gas, mixed with uncombined sulphur, in which case it is better to let the gas pass through a long trough in order to cool it, when the uncombined sulphur will deposit itself at the bottom, and the remainder may be conducted to a proper chamber, where it remains until it arrives at that state in which sulphuretted hydrogen forms its principle part, (which may be easily ascertained by sugar of lead, or any other well known test). The course of the gas is then turned and made to bubble through the sulphuric acid, which requires to be concentrated or rectified, until it produces no change in the chemical appearance of the acid; then the concentration will be complete.

Claim third.—The use by combustion of sulphuric acid gas in the production of sulphuretted hydrogen, to be used in the manufacture of sulphuric acid.

Claim fourth.—The application or employment of sulphuretted hydrogen, as an agent for concentrating or rectifying sulphuric acid, by causing it to bubble through the acid as described above, or in any other manner, whereby it may be used for the same purpose.

Claim fifth.—The use by combustion, in the manufacture of sulphuric acid, of the sulphur contained in hydrosulphuret of lime, or the compound or compounds formed by the absorption of sulphuretted hydrogen in the hydrosulphuret of lime.

Claim sixth.—The use of the calcineous residuum (remaining after all the sulphur is burnt off) in the manufacture of soda.

Claim seventh.—The application by combustion of the insoluble residuum or residuums, or part or parts of the same, in the manufacture of sulphuric acid.

Claim eighth.—The submitting or exposing to a red heat, or to a temperature nearly equal to a red heat, of a mixture of the ingredients at present used in the manufacture of sulphuric acid in the ordinary manner.

The inventors wish it to be understood, that they do not confine themselves to any form or arrangement of apparatus in working any part of this invention.

NOTICE.

In accordance with the determination expressed in our 26th Number, of giving one month's clear notice to Inventors, before publishing their specifications, we hereby inform the following Patentees, that their specifications will be published in the "INVENTORS' ADVOCATE" of Nov. 28. Each party will receive, in addition, a *private* communication to the same effect.

William H. Taylor, of Norfolk-street, Strand, due Nov. 20.
William Bush, Camberwell, merchant, due Nov. 20.
James Buchanan, Glasgow, merchant, due Nov. 20.

RAILWAY ACTS OF 1840.

1. *Arbroath and Forfar.*—To raise 50,000*l.* by additional stock or shares, and 5,000*l.* by loan. Royal assent, April 3.

2. *Ardrossan and Johnstone.*—To raise 51,700*l.* by additional stock; the improvements immediately contemptated require 30,000*l.*, and when the Glasgow and Ayr line is in operation (which a branch is to connect with the Ardrossan Railway) a further outlay of 21,700*l.*, as an additional line of rails will be required. The gross revenue for last year was 4,026*l.*, the average charge for goods is 2d. per ton per mile, and for passengers 1d. and 5-12ths per mile. No engineering difficulties, No tunnels. Length of the main line 5 miles 1,007 yards. Length of the branches 4 miles 880 yards. Estimated revenue 8,841*l.*, and estimated annual expenses 2,947*l.*, leaving a profit of 5,894*l.* Royal assent, July 23.

3. *Birmingham, Bristol, and Thames Junction.*—To raise a further sum of money, and amend existing Acts. Royal assent, July 23.

4. *Birmingham and Derby Junction, and Tamworth approach.*—Capital to be increased 170,000*l.* by shares. Expense of the new branch 46,000*l.*, greater than the original branch for which it is substituted. The new branch to terminate at Birmingham instead of Stitchford, as originally proposed. No inclined plane requiring an assistant engiue, except at the terminus at Birmingham, where there is to be an inclined plane of about 100 feet in length, rising 1 foot in 30 (to be worked by an assistant engine), for forming a junction with the Birmingham and Gloucester, and London and Birmingham Railways, and another at the same point of about 500 feet in length, rising 1 in 30, to join the Grand Junction Railway. No peculiar engineering difficulties. No tunnels. Length of the line 9¼ miles all but three chains. Estimate, including the Tamworth approach, 188,000*l.* Annual expenses from 800*l.* to 1,000*l.* per mile. 100 acres of land required. Royal assent, June 4.

5. *Bristol and Exeter Railway.*—To amend former acts. No variation in the line proposed. Royal assent, May 19.

6. *Chester and Crewe Railway.*—To consolidate it with the Grand Junction Railway, and raise a further sum of money.

7. *Dublin and Drogheda.*—To reduce the amount of capital, amend existing acts, and extend time five years. Royal assent, 23 July.

8. *Duffryn Llynvi, and Porth Cawl Railway and Harbour.*—To raise money, and amend existing acts. Royal assent, July 19.

9. *Edinburgh and Glasgow.*—To amend former act. No new capital required. Royal assent, July 23.

10. *Glasgow, Paisley, and Greenock.*—To amend former act, and make branches. No further capital required. Branches to be worked by horse power, the speed being restricted to 5 miles per hour. The proposed branches are substituted for others in the former act. No tunnel. Length of the Greenock branches altogether 2,949 yards, and the Port Glasgow branch 1,318 yards. Estimated cost 24,171*l.* Annual expenses 50 per cent. on revenue. Royal assent, July 23.

11. *Glasgow, Paisley, Kilmarnock, and Ayr.*—To amend existing act, and make a branch. No further capital required. No inclined plane on the branch. No peculiar engineering difficulties. No tunnel. Length of the branch 3,221 yards. Cost of it 25,880*l.* Annual expenses 33 per cent. on the revenue thereof. Royal assent, June 4.

12. *Hartlepool Dock and Railway.*—To raise a further sum of money, and extend the time. To raise 70,000*l.* by new shares, and 23,000*l.* by mortgage. The surplus revenue of last year amounted to 11,000*l.*, after deducting interest and all other expenses. Royal assent, July 23.

13. *Lancaster and Preston.*—To raise by loan 30,000*l.*, aud to amend existing act. Royal assent, March 23.

14. *London and Greenwich.*—To raise a further sum of money and extend the time. Royal assent, August 7.

15. *London and Greenwich Station.*—For providing an additional station and other conveniences. Royal assent, August 7.

16. *London and Greenwich (Enlargement and Station.)*—No report. Royal assent, August 10.

17. *Midland Counties.*—Further capital to be raised 150,000*l.*, and by loan £50,000, and to amend former acts. Royal assent, August 10.

18. *Newcastle-upon-Tyne and North Shields.*—To raise money and amend existing act. Royal assent, March 23.

19. *Northern and Eastern.*—To abandon part of the railway authorized by former acts to be made, and to reduce the amount of capital in consequence and to amend existing acts. Royal assent, June 4.

20. *Sheffield and Rotherham.*—To raise a further sum of money, aud ameud existing act. Royal assent, March 23.

21. *South-Eastern Deviation Line.*—No inclined plane requiring to be worked by an assistant engine. No peculiar engineering difficulties. No tunnel. Length of deviation, 4 miles, 30 chains. Estimated expense, 98,138*l.* Royal assent, May 19.

22. *Taff Vale.*—Increased capital 165,000*l.*, by subscription, and 50,000*l.* by loan. No new works proposed. Royal assent, July 23.

23. *North Union.*—To raise money, and amend existing act. Royal assent, March 23.

24. *Chester and Birkenhead.*—Increased capital, 125,000*l.*; loan, 41,666*l.*, and to amend former act. Royal assent, March 23.—*Railway Magazine.*

RAILWAY INTELLIGENCE.
DOMESTIC AND FOREIGN.

WEST LONDON.—The ninth general half-yearly meeting, and also a special general meeting, of this Company, were held at the Company's offices, 11, Abchurch-lane, on the 7th inst. The report of the Directors recommended according to the provisions of the amended Act obtained last session of Parliament, (authorising them to raise an additional sum of £60,000 by the creation of new shares) that such sum should be raised by 6,000 new shares of £20 each, to be issued to the present proprietors at £10 each. The report stated that Mr. Hosking, the late engineer to the company having resigned, the directors have secured the services of Mr. Robert Stephenson, as his succeseor. That gentleman has been engaged in preparing a report upon the present state of the line, and the best mode of carrying it out to completion. In order to afford Mr. Stepbenson time to prepare this report, the general half-yearly meeting was adjourned till this day, but Mr. Stephenson still requiring further time for its preparation, the directors proposed that the meeting should be again adjourned until the 14th of November next, to receive that report. A series of resolutions proposed by Mr. Duncan, the solicitor to the company, for raising the £60,000 in the mode proposed were agreed to. Mr. Duncan stated that Mr. Stephenson concurs with the directors in their opinion that two extensions of the line should take place; one to the neighborhood of Knightsbridge, and the other to the Thames, and that the cost o those extensious together will, in round numbers, not exceed £140,000. Lord Kensington in seconding the resolutions said it gave him great pleasure to see that the extension of the railway to Knightsbridge had been taken into serious consideration by the directors. He said he was prepared to subscribe £5,000 towards the undertaking. The meeting then adjourned to the 14th of November next.

LONDON AND BRIGHTON.—The Brighton Railway is to be partially opened on an early day in the ensuing month, which will enable the communication to be made in four hours from London to Brighton.

DONCASTER AND NORTH MIDLAND.—A public meeting was held in Doncaster, on Monday, to take into consideration the propriety of establishing a railway from Doncaster to the North Midland Railway at the Swinton station. The meetiug was numerously attended, the inhabitants being, as it were, unanimously in favor of the undertaking. The Mayor took the chair, and read the requisition. Mr. Alderman Clark moved the first resolution, to the effect that the inhabitants of of Doncaster were convinced of the necessity of a railway between that town and the North Midland. R. Baxter, Esq., solicitor, contended that the effect of a railway to Doncaster would be fatal to the prosperity of the inhabitants. He instanced such towns as Rotberham and Selby, as having suffered under the circumstances. When the Mayor, however, put the motion, it seemed as if Mr. Baxter's eloquence had had but little effect, as the only hands held up against the motion were those of Mr. Baxter and his brother. Other resolutions tending to confirm and support the first, were then moved and seconded, and were carried unanimously.—*Sheffield Iris.*

The magistrates, at Rugby on, Saturday sentenced a policeman on the London and Birmingham Railway, named Fletcher, to 14 days' imprisonment and hard labor in the House of Correction at Warwick, for neglect in the execution of his duty.

THE NORTH MIDLAND.—The directors, with a view to afford the utmost possible security against accidents on the line, determined at a recent meeting to appoint an additional police force of twenty men, to be stationed along the whole line, so that each man should have to watch an extent not exceeding three or four miles in length. This distance is to be perambulated by the policeman several times in the course of the day, so as to guard against persons walking on the railway, and also to provide that no obstruction exists which can lead to any casualty. Five of the London police are to bo appointed superintendents, with fifteen men under their direction. The directors afterwards resolved to give notice to the contractors who supplied the defective axles, one of which broke on the occasion of the late fatal accident, that the railway company would require them to replace all the axles with others of the best workmansbip, and also that they were expected to bear the expense entailed on the North Midland Company by that lamentable occurrence.

HULL AND SELBY.—Traffic returns from Sept. 28 to Oct. 4:—Passengers (4,293), parcels, &c., 559*l.* 7s. 9d.; goods, sheep, grain, &c., 191*l.* 9s.; total, 750*l.* 16s. 9d.

DURHAM AND SUNDERLAND.—The total amount of the liabilities of the company was, at the date of their annual meeting (29th ult.), 84,835*l.* 16s. 4d., and of their assets 44,492*l.* 8s. 1½d; leaving a deficiency of 40,343*l.* 8s. 2½d.; and it was proposed by the directors that, to liquidate this debt, the proprietors be requested to advance to the company a loan of ten pounds per share, at interest of 7½ per cent.; such interest, with the capital, if required, to be payable in preference to future dividends on the original capital.

RAILWAYS V. TURNPIKE TRUSTS.—The letting of St. Clement's tolls took place on Wednesday last. These tolls, which, at the last letting, fetched 1,470*l.*, and on a former occasion nearly 1,900*l.*, did not

now reach more than 855*l*. This is one of the results of our close connection with the Great Western Railway.—*Oxford Herald.*

Effects of Railroads.—There not being now a single coach on the Ashby de la Zouch road, several gentlemen residing between Leicester and Shawlane have engaged an individual named George Eaton to carry their letter-bags to and from the post-office every day, Sunday excepted.—*Leicester Chronicle.*

Provision for Disabled Railway-men.—The practice on other lines of again employing such men as in the progress of the works may be disabled by accident, has been adopted on the Midland Counties line. Several poor men who had been maimed and mutilated have, on their recovery, been put into such employment as their disabled condition enabled them to fill, and at liberal wages.—*Leicester Chronicle.*

Manchester and Leeds.—This railway, which was opened last week from Leeds to Hebden-bridge, for twenty-seven miles of the distance, is thus noticed by the *Leeds Mercury*:—"We speak on the highest authority when we say, that this railway is the greatest triumph of engineering science over the obstacles interposed by nature, presented by any railway in the kingdom. The high chain of hills which separates the counties of York and Lancaster is only intersected by one valley, namely, the valley of the Calder, and that so narrow and winding, so lined with towns and villages, and so pre-occupied by the turnpike road, the river, and the canal, as to make it exceedingly difficult to carry a railway through it. Yet, by embankments and cuttings, by removing rocks and building up arches, by occasionally diverting the river and the road, and often crossing both, by piercing the hills with short tunnels, and taking first one side of the valley and then the other, a line has been constructed, not only capable of being worked by locomotive engines, but of being easily and advantageously worked. There are no objectionable curves, and there is not one gradient having half the inclination of those on the Liverpool and Manchester Railway. The line is somewhat circuitous, and this is its only disadvantage,—a disadvantage which the speed of locomotive travelling reduces to insignificance. But the railway passes in its entire length through a country as remarkable for its dense population and active industry as for its romantic beauty. The engineer by whom the line was planned, and under whose superintendence it has been executed, is the celebrated George Stephenson, whose genius and unparalleled works we have so often had occasion to notice with high admiration. Ground was first broken on the 18th of August, 1837; the first portion, measuring thirteen miles, from Manchester to Littleborough, was opened on the 3d of July, 1839, and has been worked with great success; and the entire line will be completed early in December of the present year, within about three years and a quarter from its commencement. The length of the railway from Manchester to its junction with the North Midland at Normanton, is fifty miles; and as Normanton is ten miles from Leeds, the entire distance from Leeds to Manchester by railway is sixty miles.

Opening of the Chester and Crewe.—On Thursday the Chester and Crewe Railway was opened to the public. A train of carriages passed along the line with a party of directors and their friends, and in the course of the day another train, with passengers and luggage, performed the journey of twenty-five miles in eighteen minutes and a half. The road is in excellent condition. The opening of this line is an important event. Our readers are doubtless aware that it is the property of the Grand Junction Company, and that it shortens the distance between Liverpool, or, more strictly speaking, between the Cheshire side of the Mersey, and the metropolis, fifteen miles. It is understood that the mails for Dublin will arrive by this line, and be put on board the steamers off the Cheshire shore. —*Liverpool Chronicle.*

York and North Midland.—A meeting of the York and North Midland Railway Company has been called for the 23d instant, "to determine upon the expediency of confirming an agreement entered into by the directors of the above company, with the directors of the Leeds and Selby Railway Company, for a lease of the Leeds and Selby Railway, upon certain terms and conditions which will be submitted to the said meeting." The *Yorkshireman* states, that the proposed lease is to be for a term of thirty years, with the option of purchasing, at the expiration, the whole of the Leeds and Selby Railway, with the buildings, engines, carriages, &c., upon such terms as will allow the shareholders 5 per cent. per annum upon their invested capital of 210,000*l*., after paying the interest upon the borrowed capital of 130,000*l*., and leaving a very considerable surplus for the gradual liquidation of the debt.

Edinburgh and Glasgow.—This important work, which, when finished, will bring the metropolis of Scotland and the great manufacturing city of Glasgow within less than two hours travelling of each other, is fast progressing throughout towards completion; so that there is now little doubt that it will be opened to the public by the end of August next year. The great viaduct across the river Almond and adjoining valley, is to consist of thirty-six arches of fifty feet span, averaging about seventy feet in height, which, taken in connection with the viaduct of seven arches across the Bathgate road, already finished (between which and the great viaduct there is only a short embankment), will form one of the most magnificent ranges of stone masonry in the kingdom, about 3,000 feet in length. These works have been designed and carried into execution under the direction of Mr. Miller, of Messrs. Grainger and Miller, the company's engineers. The pillars are far advanced, the fifteenth arch is in progress, the parapet over twelve of them finished, and the contractors anticipate being able to complete this great viaduct within eighteen months from the time they commenced with it! Certainly a period unparalleled in bridge building. —*Scotsman.*

Dublin and Drogheda.—The contractor for the first lot of this undertaking commenced his operations yesterday at Hollybrook.—*Dublin Monitor*, Oct. 13.

General Tcheffkine, the Inspector General of Public Works in Russia, has, during the present week been engaged in a tour of inspection of the principal lines of railway in this country. The General has been accompanied by one of the most eminent English engineers, Mr. Vignoles, and has expressed himself highly gratified by the various works he has seen, as well as by the facilities which have been afforded him for inspecting them.—*Railway Times.*

Extraordinary Scene on the Opening of a Railway.—The *Leeds Mercury* gives the following account of the curious scene which occurred on the extended opening of the Manchester and Leeds Railway, last week, owing to the impatience of the people to have a ride by the new means of conveyance. It is clear from this account that there was some great mismanagement in the arrangements, and that it was only by the most fortunate chance some serious accidents were not the consequence:—"The opening of the portion of the line from Hebden-bridge to Normanton was not attended with any ceremonial. The directors came from Manchester to Hebden-bridge, went by railway to Leeds, and returned the same day, but without any kind of display. But this did not prevent a very great concourse of spectators at every town, village, and hamlet on the line; at many of these places, flags were flying; and the inhabitants, old and young, and of both sexes, poured forth to witness for the first time the interesting sight of railway travelling through the valley of the Calder. Considerable danger arose at some points from the eagerness of multitudes to travel by the carriages on the first day. At Sowerby-bridge especially the crowd of people was so great, and the rush of those who had taken places to the carriages so alarming, that after a brief stay of four minutes it was thought absolutely necessary to cause the train to move on. There being no room in the carriages, the adventurous travellers mounted the tops of the carriages, where already as many persons were sitting as could be accommodated in that position; but those who could not sit, stood upright, until the whole of the carriages were covered with a crowd of standers, and in that fearful position did they remain all the way to Hebden-bridge, stooping down as they passed under the tunnel, and the numerous bridges on the line, and then rising and cheering like a crew of sailors to the astonished spectators. We have seldom witnessed a more alarming scene. The train was proceeding at the rate of twenty miles an hour, and if a single individual had failed to stoop at the moment of passing under the arches his brains must have been dashed out, and the fall of one person must have thrown many others off the carriages to their inevitable destruction. Yet there was no power to prevent the crowd from thus boarding the carriages. The only thing to be done was to move on as soon as the manœuvre was discovered. Some rather ludicrous incidents occurred in consequence. The train had brought the three revising barristers, Messrs. Lutwidge, Cleasby, and Sir Francis Doyle, from Wakefield to Sowerby-bridge; where they got off to proceed to Halifax, for the revision of the lists of that borough. But ere their luggage, containing the books, lists, and we know not what other legal mysteries, could be taken off the carriages, the train was obliged to move on. The barristers, alarmed at the prospect of losing their paraphernalia, ran after the train, calling, "Stop, stop!" "We can't stop," said one in authority. "You must stop," responded Mr. Lutwidge, with a voice that would have overawed a whole court, and very red with wrath and running. But, alas! a new race has sprung up in modern days, that of locomotive engines, who know not revising barristers, and have little respect for summonses or precedents. There is no writ of *capias* avails against these iron and elephantine fellows. Away the monster moved, insolently puffing back his scorn at his pursuers, and soon gave the harristers steam-hail; the hue and cry was raised after us in vain; whilst Mr. Lutwidge, out of breath and countenance too, desisted from the pursuit, and returned to consult his learned brothers what decision they should pronounce in this novel case—a case in which the books would hardly have helped them, even if we had not carried off the said books to Hebden-bridge. We made voluntary restitution, however, an hour or two afterwards, by bringing back the portmanteaus, bags, &c., to Sowerby-bridge; and thus we hoped the revision at Halifax would not have been very long delayed. In the afternoon of the same day, under similar circumstances, a manœuvre was practised at Brighouse, which beats all recorded in the history of naval tactics. The train which left Leeds at three o'clock was assailed in the same way as that in the morning. The second class-carriages were crammed to suffocation, so that extremely few of those who were in could sit, and the least enviable position was that of those who were actually sitting. A vigorous and determined effort on the part of the railway authorities abated this nuisance, but those who were chased out of the carriages scaled the deck, and soon all were covered as in the morning. Some shrewd person perceiving that this load was too much not only for the engine to draw, but for the springs of the carriages to sustain, ordered out a wagon used for the conveyance of cattle, in which those who were on the tops of the carriages were told that they might be accommodated. Instantly the crews descended the decks and rushed into the cattle-wagon, which was crowded to excess; and as soon as this had been accomplished, and the wagon was carefully closed, the train cast off the wagon, and moved on at full speed, leaving behind the chousted and dismayed cattle amidst the infinite

amusement and applause of the spectators. It is a happy circumstance that the day passed over without any accident. The railroad is in an unfinished state in some places, and for a short distance only a single line of rails has been laid at present; therefore, many difficulties have to be encountered.

Act for the Regulation of Railways.—The act for the regulation of railways and the protection of the public came into operation on Saturday, and will, if carried out as it deserves, prevent, it is earnestly hoped, a recurrence of the lamentable accidents that have taken place on the different lines. The Board of Trade are entrusted with the regulation of all railways, and no line in future, or *any portion* of a line, can be opened, without a month's notice in writing being given to the committee of the board, who are authorised to make all by-laws. An "inspector of railroads" will be appointed, and have power to examine the works, trains, &c., used for the safety of the public. Penalties of 20*l.* to be recovered for an infringement of any directions of the Board of Trade. Any person wilfully obstructing any of the officers of a railway can, under this Act, be taken into custody without a warrant, and be fined any sum not exceeding 10*l.*, and in default of payment committed to prison for two months. By the 13th section it is enacted that any officer or agent of a company, or any special constable duly appointed, may seize and detain without warrant any engine-driver or other servant in the employ of a company found drunk while employed on the railway, or violating any of the by-laws, or wilfully, maliciously, doing or neglecting anything whereby the life or limb of any person may be endangered; and in such cases a magistrate is authorised to fine or commit the offender, with or without hard labor, for a period not exceeding two calender months. This Act has been put in operation in several instances, though it only came in force so recently. On Tuesday, James Brett, one of the head-porters and assistant-engineer on the Eastern Counties Railway, was brought before the magistrate at Worship-street police-office, upon a charge of being drunk and misconducting himself in the execution of his duty on the railway. Mr. James Bratt, superintendent of the railway, said that the prisoner had been some months employed on the railway as a porter, and had conducted himself so well in that capacity that he was recommended for promotion. On Sunday evening he went for the first time as assistant-guard of the 7 o'clock train to Brentwood, and returned on Monday morning, when he was to have resumed his duty as porter at the London end of the railway; but when he got off the train he fell back and was so drunk that the witness gave him into custody, and had him brought to this court for punishment. The defendant, who had been in the police before he entered the service of the railway company, said that he drank a glass of rum and water at Brentwood on Monday morning, but was quite sober when he started with the train, but as they proceeded along the line the liquor began to take effect on him. He attributed it to the excitement of being whirled through the air so rapidly after having drunk a little, for what he had taken would not have taken effect upon him under ordinary circumstances. The magistrate, in consideration of the previous good conduct of the prisoner and his large family, reduced the fine to 10s.

RAILWAY ACCIDENTS.

Fire on the Birmingham and Gloucester.—During the past week a serious accident has occurred on this railway near Ashchurch, by the luggage train taking fire. A great deal of property was consumed.—*Cheltenham Free Press.*

Midland Counties.—On Tuesday morning, about half-past three o'clock, as the London night train of the Midland Counties Railway was coming down the line near to Attenborough-gate, the engine came suddenly on a horse which was lying across the rails, and ere it could be perceived, cut and maimed it most dreadfully. The engine and part of the train were thrown off the line, the engineer and stoker both being hurt, and one of them very severely, through jumping off. None of the passengers, we are happy to say, received any damage.—*Nottingham Mercury.*

On the London and Birmingham.—On the 5th inst., when the down train reached the Leicester junction, the main train had detached some branch carriages—viz., two second class, one truck with a carriage upon it, and two trucks with horse boxes, and these were allowed to remain upon the same line until a train (the 9 o'clock from London) arrived there. The passengers were aroused by a fearful whistling, and in a few seconds the engine ran into the last horse-box of the branch train with a tremendous concussion, which made a complete wreck of it, besides breaking some of the other carriages and throwing three of them off the rails. The horses in the box were scalded and wounded, so as to make it desirable as an act of mercy to kill them. The engineer quarrelled with the policeman and declared the red flag was not shown in time, and the policeman maintained the contrary; and it was observed by one or two, the train was a quarter of an hour before its time.—*Correspondent of the Times.*

The late Accident on the Eastern Counties Railway.—We learn with much satisfaction that Mr. Tower, of Weald Hall, to whom the deodand of 500*l.* awarded by the coroner's jury in the late Eastern Counties accident case fell, in virtue of his right as lord of the manor, has signified his intention of distributing the whole amount among the poorer sufferers by that lamentable calamity.—*Railway Times.*

On the Carlisle and Newcastle, and on the Clarence Railways.—The following account of very serious accidents on these lines, which have not been yet recorded, is given by Mr. Leatham, the banker at Wakefield, in a letter to the *Times* of Thursday. "On the 19th of last month my wife and family accompanied me in a first class carriage from Carlisle to Newcastle. About 24 miles from Newcastle, when in the midst of social intercourse, and without any other notice except for a few seconds a jolting as on rutty road, we were thrown over, and I shall never forget the horrors I felt as a parent and a husband, till our fate was decided and the carriage came to a rest. While imprisoned, we heard the sounds of many voices, some in suffering and crying for help, and others as if rendering assistance. We found ourselves in a potatoe field, and soon a fine young sailor was carried past on a door as if dead; another had his arm broken and many had contusions, but mercifully no life was lost. I with others examined into the cause of the accident, and found the luggage carriage had been too heavily loaded, and that the axle had broken, being made of bad iron. This road was not laid down originally for locomotive power, but for horses only, and is one of the oldest, and extremely dangerous from the curves, &c. On returning from the British Association on the 28th ult., on the Clarence Railroad, from the City of Durham to Stockton, the wheel of the tender broke, and, after running 50 yards the engine stopped, but had we gone one yard farther we must have gone over, and had we been a quarter of a mile in advance, we must have been dashed down an embankment of 30 feet; but what was our astonishment on examining the fractured wheel to find four old rusty fractures, besides the part where it broke, and how much was this feeling increased to learn a similar accident had happened only three days before from the same cause, and with the same tender sent forth again, with such shameful neglect, with a wheel so defective?"

FOREIGN RAILWAYS.

Strasburgh to Basle.—The first trial on this railway, two sections of which have just been completed, viz.—from Benfeld to Colmar and from Malhousen to Basle, was made on the 25th ult. These portions of the road are ready to be opened to the public, and only await the sanction of the government engineers. The first trial was made on the portion of the line from Colmar to Benfeld. The managers of the railway ordered the locomotive "the Manchester" to be employed to convey the opening train. A char-a-banc, capable of holding thirty persons, was attached to it. The principal engineers and persons immediately concerned in the direction of the railway were the only persons who accompanied this trial train. The distance of 40 kilometres from Colmar to Benfeld, was performed, after deducting stoppages, in fifty-three minutes in going, and in forty-eight minutes in returning. On parts of the road the speed was equal to forty miles an hour. The whole line from Colman to Strasburgh is expected to be completed by next spring.

Paris to Corbeil.—The success of this railroad appears to surpass the expectations of the company. Notwithstanding the badness of the weather and the time of the year, this railroad conveyed from the 20th to the 27th of September, 18,337 passengers.

A Belgian journal states, that a few days ago the locomotive engine of the train on the railroad between Brussels and Ostend, when near Melle, ran over a cow which had strayed on to the road, and cut her in two. The tender and some of the waggons were turned off the rail, in consequence of which a stoppage took place. During the confusion thus created a bleating was heard, and when the spot was cleared a young calf was discovered between the rails, having been brought to life by this rude Cesarean operation upon its mother. The Burgomaster of Melle claimed the new-born animal which is doing well, and intends to rear and preserve it in commemoration of its miraculous birth.

THE BANK OF FRANCE.

In pursuance of the law of the 30th of June, 1840, the Bank of France has published a statement of its position on the 30th of September last, and this position proves, observes the *Commerce*, the truth of the assertion made during the debate upon the prorogation of the Bank privilege, that according as the Treasury withdraws its funds, the Bank contracts its discounts.

On the 30th of June the Bank was indebted to the Treasury 163,342,164f., and held bills of exchange which it had discounted to the amount of 171,431,988f. On the 30th of September the Bank was indebted to the Treasury only in the sum of 125,358,477f., and held commercial bills which it had discounted to the amount of only 157,500,448f. The Bank had likewise reduced its advances to the provincial branch banks from 25,736,000f. to 20,462,458f.

The advances made by the Bank on Government securities amounted on the 30th of June to 8,996,970f., and on the 30th of September to 9,117,416f. This, observes the *Commerce*, is a proof that the speculators at the Bourse had been favored by the Bank. The advances made by the Bank on deposits of bullion had likewise increased from 24,008,600f. on the 30th of June, to 28,636,200f. on the 30th of September.

The bullion in the coffers of the Bank of France amounted on the 30th of September to 255,426,087f. The bills of exchange discounted to 157,500,448f. The securities for cash advanced on ingots to 28,636,200f., and securities for cash advanced on Government securities to 9,117,416f. On the other hand, the bank-notes in circulation amounted to 227,278,000f. Bank-notes to order 1,727,605f. The credits of cash accounts to 87,385,956f. Receipts payable at sight, 8,654,000f., and the sum to the credit of the Treasury, 125,358,477f.

The advances made to the provincial branch banks for capital amounted to 20,462,458f.

In the course of the last three months the Bank discounted to the amount of 232,074,900 commercial bills. It lent upon deposits of bullion 62,294,700f.; upon public securities, 28,780,000f.; and upon Treasury bonds, 8,065,600f.

THE REVENUE.

Abstract of the Net Produce of the Revenue of Great Britain, in the Years and Quarters ended the 10th October, 1839 and 1840.

	QUARTERS ENDED.		Quarter ended Oct. 10, 1840.	
	Oct. 10, 1839.	Oct. 10, 1840.	Increase.	Decrease.
	£.	£.	£.	£.
Total Customs	5,778,006	5,662,877	.....	115,129
Excise	4,113,159	3,916,249	.....	196,910
Stamps	1,699,724	1,751,417	51,693	.....
Taxes	311,283	332,807	21,524	.....
Post Office	407,000	123,000	.....	284,000
Crown Lands	40,000	45,000	5,000	.....
Miscellaneous	17,654	24,382	6,728	.....
Total Ordinary Revenue	12,366,826	11,855,732	84,945	596,039
Imprest and other Moneys	41,426	82,999	41,573	.....
Repayments of Advances	234,045	172,499	.....	61,546
Total Income	12,642,297	12,111,230	126,518	657,585
The Amount applied to the Consolidated Fund, exclusive of Advances and Payments of Exchequer Bills issued as Advances	9,394,564	8,682,179	Deduct Increase	126,518
Amount applied as Advances, and to pay off Exchequer Bills issued as Advances	230,761	70,000	Decrease on the Quarter.	531,067
Amount applied as Part of the Ways and Means of the Year	3,016,972	3,359,051		
Total	12,642,297	12,111,230		

	YEAR ended Oct. 10, 1839.	YEAR ended Oct. 10, 1840.	Year ended Oct. 10, 1840.	
			Increase.	Decrease.
	£.	£.	£.	£.
Customs	19,915,296	20,152,739	237,443	.....
Excise	12,152,171	11,985,467	.....	166,704
Stamps	6,508,523	6,726,317	217,794	.....
Taxes	3,713,784	3,744,372	30,588	.....
Post Office	1,533,000	694,000	.....	839,000
Crown Lands	160,000	167,500	7,500	.....
Miscellaneous	103,907	84,479	.....	19,428
Total Ordinary Revenue	44,086,681	43,554,874	493,325	1,025,132
Imprest and other Moneys	499,964	454,784	.....	45,180
Repayments of Advances	756,009	656,140	.....	99,869
Total Income	45,342,654	44,665,798	493,325	1,170,181
The Amount applied to the Consolidated Fund	31,602,822	31,836,088	Deduct Increase	493,325
Ditto. as Advances, and to pay off Exchequer Bills issued as Advances	874,838	559,592	Decrease on the Year	676,856
Ditto, as part of the Ways and Means of the Year	12,864,994	12,270,118		
Total £	45,342,654	44,665,798		

EGYPTIAN STATISTICS.

A report upon Egypt and Candia, addressed to Lord Palmerston by Dr. Bowring, and presented to both Houses of Parliament, has lately been printed. The report includes almost every important subject connected with the condition of those countries.

The total population of Egypt is estimated by the Government at 3,200,000 souls; but Dr. Bowring "found it impossible to come to anything like a certain calculation" upon the subject. He states, however, as the opinion of those who are best informed upon the matter, that the number of the population ranges from 2,000,000 to 2,500,000, and that the females are to the less worthy part of the community in the ratio of two to three.

The classes which principally make up the mass of the population are Turks, Mahomedan Fellahs, Christian Copts, Franks, and Levantines. The Turkish race rarely perpetuates itself in Egypt, as the children invariably die, and the Turkish population is kept up by an importation of Mamelukes. The Turks, however, though comparatively few in number (between 18,000 and 20,000 altogether), have nearly a monopoly of all the considerable situations of an official character in the country. The Fellaheen comprise nearly all the agricultural population of Egypt, and are the class from which the Government draws all its soldiers, artisans, and laborers. This important part of the people is characterised by the report as being submissive to authority, gay, joyous, careless for the future, and contented with little. The Fellah is distinguished for the mildness of his temper, the resignation of his disposition, an intense love of peace, and an equally intense horror of everything connected with a military life, to avoid which he inflicts upon himself the most dreadful mutilations, and even abandons his native village in the valley of the Nile, although his affection for the locality is such, that in absence he speedily perishes of the home-ache.

The annual revenue is stated by the Government to amount at present to 900,000 purses, or £4,500,000 sterling. A somewhat minute account is given of the items in the budget of 1833, from which it appears the land tax, or rent, as it ought more properly to be called, constituted about one-half of the whole amount, and the customs about one-twentieth. The revenue is stated to exceed the expenditure every year, and there is no national debt. The celebrated manufactories of different kinds, which have excited so much attention in Europe, are almost invariably conducted at a loss, and there seems reason to believe that they would all, or the greater part of them, go to immediate ruin upon the death or political discomfiture of the present Pacha.

In respect to population; it appears that Beyrout ranks the sixth amongst the towns of Syria, and contains, or rather contained, 12,000 inhabitants. It was considered by Mr. Moore, the consul, to be the healthiest town on the coast, being less subject to fever than Acre, Tripoli, or Tyre. The cultivation of silk was spreading rapidly, and that of the sugar cane had taken place to some extent in the neighborhood, which was considered well adapted for its production, and gold and silver thread were amongst the manufactures of the town. The population was greatly increasing, and the neighborhood rapidly improving in cultivation and fertility. One fact alone is sufficient to prove the rate at which its prosperity was increasing, namely, that the rent of houses and warehouses had doubled within four years.

TO CORRESPONDENTS.

GRATUITOUS COPIES *of our Journal have been forwarded to a number of Individuals interested in some Patent, or Invention, of which notice has been taken in our number of to-day.*

"THE INVENTORS' ADVOCATE" *is published every* SATURDAY MORNING, *at* 7 O'CLOCK; *if, therefore, our Subscribers do not receive their copies* regularly *from their Newsmen, the fault never rests with* US.

For the convenience of persons residing in REMOTE PLACES, *the* "INVENTORS' ADVOCATE" *will be regularly issued in* MONTHLY PARTS, *stitched in a handsome wrapper.* PARTS 1 *to* 16, ARE NOW READY.

ADVERTISEMENTS *should be sent in not later than* Thursday Evening.

TWO *numbers of the* "INVENTORS' ADVOCATE" *(Nos.* 48 *and* 49*) were published* July 4. *The former contains, in addition to the usual varied matter, the* TITLE PAGE *and* a Copious INDEX *to the* SECOND VOLUME.

VOLUME II. *of the* "INVENTORS' ADVOCATE," *handsomely bound, is* NOW READY. *A* FEW COPIES *of the* FIRST VOLUME *still remain on hand.*

"F. W."—*The following query has been put to us.—"After about* 18 *months' application, I have succeeded in perfecting a simple arrangement of Mechanism, likely to be of considerable benefit to Railways, and other purposes; and was about to apply for Patents for England, Ireland, and Scotland, to secure the same. But in one of your Journals recently published, I find the French Government have granted a Patent for effecting the* same end, *by the* same means; *does this* disqualify *me for* still *securing a* patent *in this* country *?"—In reply, we beg to say that the simple notice in a publication of a Patent having been granted by a Foreign Government for a particular invention, is no obstacle to a patent being obtained for the same invention in England. But if the specification, or full description of the Foreign invention were published before the English patent was secured, the latter would be invalidated. An English patent, obtained for an invention previously patented abroad, is valid, provided such invention has not been described in a printed Work, or used in England before the date of the English patent.*

The speculations of "E. M." *are under consideration; they may, perhaps, be alluded to next week.*

"Zeta" *is thanked for the interest he appears to take in our Journal. We are glad the alteration to which he alludes meets his approbation.*

"Mr. Beare's" *letter, in its present form, is too much like an advertisement. If we can remodel it, to give the facts, it shall be inserted in our next.*

"E W." *is informed, that the patentee in question has* not *enrolled his specification.*

"C. Dixon."—*In this matter, we must refer you to your solicitor. It is a point of law, on which he will be able to advise you how to proceed safely.*

"W. Harris."—*The invention is not new; a patent of a similar kind was taken out in* 1830, *as will be seen by reference to the Index of our Second Volume.*

*** *All letters for the Editor of the* INVENTORS' ADVOCATE, *are requested to be addressed to the Patent Office, British and Foreign, No.* 198, *Strand.*

TO CAPITALISTS, MANUFACTURERS, AND TRADERS.

Among many VALUABLE INVENTIONS *and* PATENTS *registered at the* PATENT OFFICE, BRITISH and FOREIGN, (198, STRAND), *for the investment of capital, Shares are offered for sale in the following Useful Inventions:—*

A Fire Escape of Novel Construction, which may be used as an Observatory.

A Cheap Lamp for burning Tallow and Grease, without overflow or smell.

Patent Screw Jack, for lifting locomotives and other great weights.

An Improved Balance, applicable to small or great weights.

Important Improvement in Wood Paving.

A New and Improved Method of Burning Coke.

New Methods of Purifying and Treating Oils.

Patent Forge Back.

A new Castor for Furniture.

Patent Process for the Manufacture of Soda.

Improved Methods of Building Iron Ships.

A New Method of Tanning.

The Purification of Gas.

TO INVENTORS.

PERSONS WHO WISH TO OBTAIN OR DISPOSE OF PATENTS, *or to bring* NEW INVENTIONS INTO USE, *are requested to apply to the* PATENT OFFICE, BRITISH and FOREIGN, No. 198, STRAND, *opposite St. Clement's Church, where they will meet with great facilities to obtain information and to carry out their views.*

THE GALLERY OF INVENTIONS,

Attached to the Patent Office, is a spacious Saloon, well lighted, in which Plans and Models are exhibited. It affords an excellent medium for bringing New Inventions into public notice.

THE

INVENTORS' ADVOCATE,

AND

JOURNAL OF INDUSTRY.

SATURDAY, OCTOBER 17, 1840.

*** *The Office for the publication of* THE INVENTORS' ADVOCATE, *is removed from Tavistock Street, Covent Garden, to the Patent Office, British and Foreign,* 198, *Strand; opposite St. Clement's Church.*

The statement of the quarter's revenue presents a very unfavorable view of the prospects of the country. There were circumstances in the past quarter that might have led to the anticipation of a different result than a diminution of the revenue. The harvest, which naturally influences the prosperity of the country and the comforts of the people, has been at least of average abundance, and of more than average quality. The laboring classes have been generally well employed; nor have we heard of any branch of industry that was particularly depressed. The reports lately received from the manufacturing districts in the north have been, indeed, mostly favorable. With internal tranquillity, good harvest prospects, and improving trade, it might be supposed that the revenue would have exhibited a corresponding improvement, even at the former rate of taxation. It must be borne in mind, however, that an increased revenue has become absolutely necessary to meet the recently increased and still increasing expenditure of the country, and that with a view to obtain this increase, additional taxes have been imposed. Five per cent. additional was levied on all the Custom duties, and ten per cent. on the assessed taxes. These additions to the burdens of the people, it was calculated by the Chancellor of the Exchequer, would have raised the revenue receipts £584,000 in the quarter. Instead of an increase, however, the revenue returns, made up on Saturday last, exhibit a falling off exceeding half a million. It is said, indeed, that owing to some neglect of the excise collectors, there is a sum of £400,000 belonging to the last quarter which has not been paid in, and will be carried to the next quarter's account. There is generally some statement of that kind made as an excuse for decrease of revenue; but even giving the excise accounts credit for this amount, there would still be a deficiency of upwards of £100,000 on the quarter; whereon a large increase was expected, and calculated on, to meet the increasing demands of the government.

The cause of the deficiency has been attempted to be accounted for in various ways. The unsettled state of affairs on the continent and the prospect of war have embarrassed and checked our trade with France. This is advanced as one cause of the diminution of the custom duties; though by others, it is attributed to the diminished supply of sugar from our West Indian colonies. The decrease of the sugar duties amounts, in fact, more than the total deficiency in the customs, but it must be remembered that the additional five per cent. has come into operation; therefore, even though we consider the decrease in the sugar duties as an extraneous circumstance, not bearing on the general commercial prosperity of the country, there would still be a large deficiency to be accounted for.

The real fact seems to be, that the attempt to increase the revenue by increasing the duties on the customs and excise has failed. How it could be expected to be otherwise than a failure, with former experience of the effects of diminished duties in increasing consumption and revenue, we cannot conceive. The plan of increasing the duties indiscriminately was a most clumsy way of proceeding, little suited to the advanced state of political science. Whilst some articles of luxury might bear an increase of taxation without much diminution of consumption, the raw materials of manufacture and articles used by the middle classes of society, have been clearly shown by experience to be materially affected by the amount of duty; a diminution of duties on those commodities having frequently been followed by an increased revenue owing to the greatly augmented consumption. The result of this crude mode of dealing with taxation shows the necessity of extreme caution in making regulations which so seriously effect the commerce, manufactures, and revenue of the country. We hope it may be the means of hastening a revision of the whole system of taxation, so that it may be brought to operate less prejudicially than at present on manufacturing skill and industry.

SPONTANEOUS COMBUSTION.

The recent mysterious fire on board the *Talavera* at Devonport dock-yard, and the probable origin of it from the spontaneous ignition of oily substances mixed with tow and carbonaceous matter, have directed attention to the circumstances in which combustion takes place from the decomposition of such materials. It is a fact, however, better ascertained than can be accounted for, that fixed oils when mixed with any light kind of charcoal, or substances containing carbon, such as cotton, flax, or even wool, which is not of itself inflammable, heat by the process of decomposition, and after remaining in contact some time, at length burst into flame. This spontaneous combustion takes place in waste cotton which has been employed to wipe machines, and then thrown away and allowed to accumulate into a heap. We have known an instance of the kind in a manufactory for spinning worsteds, where the waste wool or "slubbings" as it is termed in Yorkshire, was thrown into a corner and neglected. It then heated, and was on the point of bursting into flame, when the attention of the workmen was directed to the heap by the smoke and smell. In cotton-mills the danger exists in still greater degree, and it is believed that the destruction of many cotton factories has been occasioned by this means. The cause of this peculiar property of fixed oils deserves more attention than has hitherto been paid to it. If the fire at Devonport can be satisfactorily traced to this origin, it will be the means of setting on foot chemical inquiry into a subject of much interest; and may, perhaps, tend to elucidate some of the hidden phenomena respecting combustion that are at present involved in obscurity.

NEW INVENTIONS.

IMPROVED SAFETY VALVE.

A new safety valve has recently been invented by Mr. John Bakewell, of Pittsburgh, in the United States, which offers advantages superior to those of any that we have hitherto examined. We are not at liberty at present to explain the particulars of its action, but it may be stated generally, that its principle depends on a new application of fusible metal, or amalgam, which acts by becoming melted when the water in the boiler is heated beyond the required degree. The valve not only begins to act when the pressure becomes too high, but it holds itself open; and the peculiarity of it is, that the more heavily it is attempted to load the valve, the greater is the certainty of its acting before the pressure in the boiler becomes dangerous. The invention has been shown to one of the most eminent engineers in this country, who thinks it extremely ingenious. The only objection raised to it is, that no improvement is required in safety valves, as the one in common use acts well enough. It is asserted that nine-tenths of the accidents that occur from the bursting of boilers arise from causes which no safety valve could provide against. Even assuming this position to be correct, if the improved safety valve under consideration tend to prevent accidents, one time out of ten, its introduction would be an object of considerable importance.

NEW PROCESS OF ZINCING COPPER AND IRON.

The German chemist Boettiger, in making some attempts to give to sheets of copper, by means of solvents, the appearance of pinchbeck or brass, as is done in the manufacture of mosaic gold by means of the vapors of zinc, has discovered a simple and economical means of covering with a brilliant coating of that metal all kinds of articles of copper manufacture, which may be useful for various purposes. It may be supposed from the effect produced in the voltaic pile on the discs of copper and zinc by pasteboard soaked in a solution of sal ammoniac, that that salt is the best agent to cover any metallic substance with a coating of zinc. To perform the operation, granulated zinc (obtained by pouring the melted metal into a hot iron mortar, and stirring it rapidly with the pestel till it becomes solid) is placed in a porcelain capsule, or any other non-metallic vessel; a saturated solution of sal ammoniac is poured upon it, and heated to the boiling point. The articles to be covered with zinc are then put in, after having been previously well cleaned with a weak mixture of hydrochloric acid, and in a few minutes they are covered with a brilliant coating of zinc, which adheres with great tenacity, and cannot be removed by common friction. Iron and steel may be plated with zinc in the same manner, after having first coated them with copper by placing the articles in a solution of sulphate of copper.

THE PROPELLER STEAM-BOAT.

An experimental steam-boat, called the *Propeller*, has been plying, every hour, for some days past, between Blackwall and Greenwich. The steam machinery of the *Propeller* is nearly the same in all respects as that of the common steam vessel; instead, however, of paddle-wheels, it is propelled by a single paddle on each side of the vessel; by this means there is no "backwater." The *Propeller* is easily distinguished working on the river by the curious spider-like action of the iron work which works the paddles. It is twenty-four horse power, and goes beautifully eight or nine miles an hour. The speed is at present very slow compared with that of the other steam-boats on the river, but it might be increased by increasing the number of propellers on each side.

NEW SURGICAL INSTRUMENTS.

At the meeting of the London Medical Society on Monday last, Mr. J. Harrison Curtis, a fellow of the society, who is just returned from the Continent, exhibited two new instruments which he has brought with him; the one an auriscope, which, by the aid of a lamp and condensing lens, enables the practitioner to examine the ear. The other, an instrument invented by Dr. Jager, the oculist of Vienna, called a phantom, by means of which every kind of operation on the eye may be performed on the eyes of a dead subject or of any animal, just as if they were in the living head.

NEW RAILWAY CARRIAGES.

The directors of the Midland Counties Railway have this week introduced new carriages, which it is expected will greatly add to the ease of travelling on the line. It has hitherto been a subject of complaint with passengers on almost every line of railway that the carriages rocked and jolted like stage-coaches on a bad road. By some this was supposed to be occasioned by the imperfect state of the line; by others, that the fault was with the vehicle in which they were travelling. The directors of the Midland Counties Railway, inclining to the latter supposition, have caused carriages to be made at their own manufactory, suspended by leather braces, instead of iron, for the purpose of obviating the inconvenience; and this has been found to be a decided improvement. The new carriages are painted like the old mails, and look well. The middle portion is for first class passengers, and the other for second class.—*Leicester Chronicle.*

SCIENTIFIC CORRESPONDENCE.

ON THE OBLIQUITY OF THE ECLIPTIC AND TRANSITION OF THE POLES.

To the Editor of the "Inventors' Advocate."

SIR,—Whether Mr. Saull be right or wrong in his surmise relative to the transition of the poles of the earth, it nevertheless appears evident that a revolution of the earth *en masse* latitudinally has taken place, from the consecutive order in which the fossil remains are found; this indicatioa of a general law sufficiently proves that no local phenomenon similar to a *supposed* "deluge" could have produced an alternation of climates as determined by geologists.

Your correspondent Mr. Utting states,—"animals have been found frozen in ice, in northern climates, covered with hair and wool, indicating a cold climate, and had their *skeletons only* been found, they might have been supposed to have been inhabitants of warmer regions." Now did the science of geology rest on so sandy a foundation, this insinuation might be triumphant; but so far as I am acquainted with geology, I have never seen reason to suspect geologists of coming to a conclusion without the assistance of physiology, which I believe in all their researches has determined in what climes certain animals existed. He mentions as an undoubted fact, "*the upheaving* of whole continents." I beg to state that this theory which once dawned has had its day, the earth no longer being regarded as a volcano; the simple fact of the recession and advance of the ocean being sufficient to show the cause of the appearance and disappearance of dry land.

I will reverse Mr. Utting's sixth paragraph, and say, without any reference to polar transition, I consider the cause, whatever it might be, that effected an alteration in the climate, might also effect their entombment—that of animals extinct. To place the axis of rotation at any time in the plane of the ecliptic, I must candidly confess, appears to me discordant to the mechanical arrangement of the system; but I conceive it possible that the mass of the earth changes its celestial position, and that all parts have had every latitude.

Professor Phillips, in his Treatise on Geology (Encyclopædia Britannica, Treatise, page 279, last two paragraphs) remarks—"Of the great physical events to which a change of level may be ascribed, sound reasoning excludes all that are exterior to our globe; none of its relations to the sun and planets, none of the changes of these relations, are of importance in the matter. The only leading event really influential in the point, which we may imagine possible, though astronomers give no encouragement whatever to the admission of it as a basis of speculation, is a change of the position of the earth's axis."

"Upon the occurrence of such event, there would evidently be a new disposition of the ocean; its waters would flow from the new poles to the new equator, and some ancient lands might thus be submerged and extensive surfaces laid dry."

The above gentleman is no mean authority; the idea he has adopted is fast gaining ground, and it only remains for us to throw off all preconceived dogmas, and by eliciting truth to harmonise geological facts and astronomical phenomena.

I am, Sir,
Yours repectfully,
J. M. CAVALIER.

Stepney,
October 12, 1840.

To the Editor of the "Inventors' Advocate."

SIR,—Allow me to close the controversy with Mr. Utting, by asking how he happened to quote Mr. Saull's theory in his first paper, if it were "sent to the *Uranian* Society before Mr. Saull's paper on the subject was read?" I was in the chair, and did not hear anything of Mr. Utting's paper.

The new geological theory of Mr. Utting I leave to others to judge of; but I insist that the transition of the poles would have no such effect on the waters of the ocean as he describes.

Your's, &c.,
R. J. MORRISON, Lieut., R. N.

MEAN TEMPERATURE OF THE EARTH.

Comparison of the mean temperature of *June* and *December*, with the yearly mean, as observed during 6 years, from 1834 to 1839, at Brussels:—

	June & Dec. deg.	Yearly mean. deg.
3·3 metres above the surface	10·955	10·48
On the surface.	10·245	9·83
0·19 metres below the surface	9·935	9·34
0·45 metres below ditto..	10·165	9·75
0·75 metres below ditto..	10·285	10·04
1·00 metres below ditto..	10·850	10·75
3·90 metres below ditto..	11·770	11·93
7·80 metres below ditto..	11·805	11·85
June and Dec. total. Mean..	10·751	10·50
Mean of 17,532 observations..	10·500	
Diff. +.....	0·251	

To the Editor of the "Inventors' Advocate."

SIR,—The above table, deduced from the *Deuxième mémoire sur les variations annuelles de la Température de la Terre à différentes profondeurs,"* by Professor Quetelet, of the Royal Academy of Brussels, will tend to confirm the hypothesis I have some years since offered, that the mean yearly temperature depends on the sun's zenith distance, and that, therefore, the mean of the temperature of June and Dec. will be the annual mean. It will be seen that the mean of all the observations agree to within ·02 of a degree of the centigrade scale with the mean temperature of the free air, taken at a height of 3·3 metres, or 10 feet 10 inches above the surface. Therefore, we discover that this is the fittest height to make observations for ascertaining the mean temperature; and we also perceive, that to obtain the yearly mean temperature, we need only observe during two months, viz., June and Dec., and then the following formula will suffice;—T. $= \frac{(i + d.)}{2}$ where T is the yearly mean, and i and d that of the months, June and December.

It likewise appears that although there is a trifling difference between the relative amounts observed and calculated, this disappears at a depth of one yard; where the mean temperature of the earth will be exactly that of the free air at an elevation of 10 feet 10 inches above the surface.

Your's, &c.,
R. J. MORRISON, Lieut., R. N.

REPORTS OF SCIENTIFIC MEETINGS.

(*Contributed expressly to the Inventors' Advocate.*)

URANIAN SOCIETY.

ON COMETS.

Communicated by J. Utting, Esq., Lynn Regis, Norfolk, to the Secretary.

Mr. White, in his paper on Comets, states that "Dr. Halley calculated the aphelion point of the orbit of the Comet of 1680, to be no less than eleven thousand two hundred million of miles. The period of this comet is estimated at 575 years." He assumes, that "as Herschel appears to sweep the very verge of our solar system, as at present known, it is *very evident* that this comet travels into infinite space, and *visits other systems* than that of which the earth forms a part.

Now, in order to arrive at something like the dimensions of that portion of infinite space allotted to our system, I shall assume the annual parallax of Sirius (being generally considered the nearest fixed star), to be equal to one second, consequently its distance from our sun will amount to 206,264 times the diameter of the earth's orbit, or to 39

billion three hundred thousand million of miles, exceeding the distance of the comet of 1680 by more than 3,500 times. The periodic time of a planet revolving round the sun at *half* this distance, would occupy 93,678,000 years; and its time in falling to the sun from the neutral point, by virtue of the sun's attraction only, would occupy 16,560,000 years, and, admitting their attractive powers to be equal, the time in which they would fall together by virtue of their *mutual attraction* would occupy 33,120,180 years. We are informed by the late Dr. Thos. Young, in his treatise on Natural Philosophy, (2 vols. 4to., 1807,) "that Sirius and the sun if left alone, would occupy 33 millions of years in falling together." This, in fact, is the least period of time that a comet would occupy in passing from the neutral point to our sun and back again. Hence, it is evident that a comet would not pass from our sun to the confines of his attractive power in less than 16½ million of years. If we suppose a comet to pass from our sun to Sirius and back again, its period would occupy 66 million of years.

Although I have assumed 1 sec. for the annual parallax of Sirius, no appreciable quantity has hitherto been discovered.

According to Mrs. Somerville, "our sun is situated 100 *billions of miles, at least*, from the nearest fixed star." (*Connection of the Physical Sciences, page* 385.)

The periodic time of a body revolving round the sun at this distance would occupy upwards of 1075 million of years, and would be more than 190 million of years in falling to the sun from the above distance, by virtue of the sun's attraction only. A comet would occupy upwards of 268 millions of years in passing from the nearest fixed star to our sun and back again, admitting the attractive power of the star to be equal to that of the sun.

Laplace estimates that the solar attraction extends through a sphere whose radius is 100 million of times greater than the distance of the earth from the sun, or upwards of 9,527 billion of miles, being more than 850 thousand times the distance of the comet of 1680!

The periodic time of a planet revolving round the sun, at a distance of 11,200 millions of miles (the distance of the comet of 1680), would occupy about 1,274½ years; and fall to the sun in 225¼ years, by virtue of the *sun's* attraction alone. Admitting this comet to have passed round a fixed star (as another sun), this star must have an annual parallax exceeding the mean parallax of the moon, or equal to 58 min. 29·25 sec. If a comet is once within the sphere of the sun's influence, there is little probability of its ever receding beyond it, or of its passing to any other system, as the resistance it would experience in passing through celestial space (were the medium less than infinitely rare) would cause such a retardation in its motion, as would for ever after prevent its again passing beyond the sun's influence. The *horary* motion of a comet in passing from the sun must amount to 1,414,924 miles.* Otherwise, the comet cannot pass beyond the sun's influence, independent of any resisting medium. And if the velocity of a comet in *passing to the sun* exceeds that in passing from the sun, it will still continue its course (i. e. in the same direction), as the sun's attraction will not be sufficient to bring it back again!

NOTE.—The foregoing observations are advanced in order to show the improbability of comets visiting other systems, for instead of 575 years, their periods would occupy many millions of years in passing from our sun to the nearest fixed star. As, according to the most accurate observations, their distance cannot be much less than what I have assumed in my computation, the space therefore allotted to our system is forty-two thousand millions of times greater than admitted by Mr. White, in his paper on comets, even supposing that the comet of 1680, passed to the *neutral point* only, instead of its visiting other systems, as Mr. White supposes. Were the distance of the nearest fixed star no more than eleven thousand two hundred millions of miles, its annual parallax instead of one second only, would amount to 58 min. 29·25 sec.

* The greatest horary motion of the comet of 1680 was only 1,227,183 miles; hence it is very evident that this comet had not sufficient velocity to carry it beyond the influence of the *sun's* attraction. We may therefore conclude that no comet hitherto observed has passed beyond the boundary of our system.

ZOOLOGICAL SOCIETY.

Sept. 8. *J. Whishaw, Esq., in the Chair.*

The first communication read was, a paper on some new species of the genus *Cardium* (cockles) in the collection of Mr. Cumings, by Mr. Sowerby, who also exhibited several interesting specimens. Mr. Gould next read a description of the *Brush Turkey* of Australia, a bird which has excited a great deal of controversy amongst naturalists. By the quinary system of arrangement, it is placed amongst the birds of prey (with the vultures), whilst others class it with *Manura* or lyre-bird. Professor Owen made some remarks upon the bird, giving it as his opinion, that it was *Gallinaceous*, and nearly allied to the Curassows. Mr. Gould, who exhibited two specimens with a perfect skeleton and an egg, gave some curious particulars of its Natural History and habits. The birds were described as gregarious, and many of them unite together to form a nest of a pyramidal form, in which they deposit their eggs, which are left to hatch by the heat generated by the fermentation and decomposition of the materials of which it is composed, being principally vegetable. Mr. Gould had plunged his arms in one of these nests in its native situation, and found it of a temperature of 90 degrees of Fahrenheit; and some of them are found to contain upwards of a bushel of eggs, which are rather larger than those of a goose. By the natives these eggs are sought after eagerly, and they are described by all who have partaken of them as very delicate eating. Mr. Macleay, the celebrated naturalist resident in New South Wales, had one of these birds in the garden, which was a male, and which set about collecting materials for its nest. Like the whole of its species it was, however, very pugnacious, allowing no other bird to approach near it. Seeing its shadow in a water butt, and being anxious to engage with it, the bird lost its balance and was drowned. In the course of this notice, Mr. Gould made some curious remarks on the migratory habits of some birds of the Australian species. There are some which will inhabit a large tract for about 20 years, and which will then migrate to another spot, at a distance of 200 or 300 miles, which they will again, after a similar lapse of years, desert; a circumstance, perhaps, attributable to their having exhausted their resources of living in those particular spots. In many districts where certain species have been plentiful, they will suddenly become rare. Mr. Gould exhibited several rare birds containing many new forms, the particulars of which were promised at an early meeting.

HORTICULTURAL SOCIETY.

Sept. 14. *Dr. Henderson, V.P., in the Chair.*

The show of flowers and fruits was not very extensive, but there were some good specimens. Mr. B. Fielder, gardener to W. Linwood, Esq., exhibited a Moscow Queen pine-apple, weighing 4 lbs. 8 oz., and Mr. Buck of Blackheath, some fruited plants in pots of Deccan grapes. There was a good collection of fruits from the gardens of the society, the most prominent of which was a new Bigarrean cherry, which was considered the latest of the firm-fleshed of this fruit; a new plum named Dornton's *Imperatrice*, one of the last raised by the late president of the society, and the original plum which produces the German *prunes*, with *six* new varieties of pears and *eight* of apples. There was a good show of flowers, amongst which was an *Iponivea* from Mr. Lee of Hammersmith, and a new *Stylidium* and *Boronea* from Mr. Low, of Clapton. From Mr. Christie, of the Clapham Road, was a large specimen of the flower of *Cereus triangularis*, which although white, a great deal resembled the night-blowing cereus, from coming into bloom in the morning. Mr. Browning exhibited a very pretty drawing of flowers, on Chinese rice paper, which is, however, but the inner layer of a tree of the genus *Hibiscus*. From the Gardens of the Society were some fine blooms of Dahlias, Roses, Lupines, Statices, a Dendrobium, an Alpine *Epiphyte*, a native of the highest part of the Himalaya mountains, with two species of *Cattleyer* and other varieties of Orchidaceous plants. The prizes awarded were—silver Knightian medals to Mr. Henderson for his new plant, and Mr. Fielder, for his Moscow Queen pine-apple. Lord Prudhoe was proposed a member; and being the son of a peer, was elected immediately. The extract from the Meteorological Register, kept at the gardens, from 1st to the 15th September, gave—Barometer, highest, September 6, 30.196; lowest, September 14, 29.197; thermometer, highest, September 1, 80 deg., and lowest, September 13, 34 deg.; and quantity of rain 0.82 inches. The meeting then adjourned.

CHEMICAL PHYSIOLOGY OF PLANTS.

One of the most important papers read at the recent meeting of the British Association for the Advancement of Science was the following notice by Professor Graham, of Professor Liebig's new chemical views relative to agriculture and physiology, contained in his report on the applications of organic chemistry in agriculture and physiology. The paper was read in the section of chemistry and mineralogy, and gave rise to an interesting discussion, in which the claims of Sir Humphrey Davy to the honor of applying chemistry to the improvement of agriculture were considered. The notice drawn to these views of Professor Liebig would, it was expected, be the means of effecting great improvements in practical agriculture.

The primary source, it is easily observed, whence man and animals derive the means of their growth and support, is the vegetable kingdom. Plants, on the other hand, find new nutritive material *only in inorganic substances*. It is obvious that the last proposition, if true, will afford a firm basis on which to build the superstructure of the Chemical Physiology of Plants.

A very different opinion has hitherto prevailed. The fertility of every soil has been generally supposed by physiologists to depend on the presence in it of a peculiar substance, to which they have given the name of humus. This substance, believed to be the principal nutriment of plants, and to be extracted by them from the soil in which they grow, is itself the product of the decay of other plants. The obvious difference in the growth of plants, according to the known abundance or scarcity of humus, was considered an incontestible proof of the correctness of this opinion, yet Liebig adduces the most conclusive proofs that humus, in the form in which it exists in the soil, does not yield the smallest nourishment to plants.

I. The humus or humic acid of chemists, obtained by means of precipitating an alkaline decoction of mould or peat, by means of acids, although soluble when newly precipitated, is known to become completely insoluble when dried in the air, or when exposed in the moist state to the freezing temperature. This is also demonstrated by treating a portion of good mould with cold water. The fluid remains colorless, and is found to have dissolved less than 100,000th part of its weight of organic matter, and to contain merely the salts which are present in rain water. Decayed wood also yields only slight traces of soluble materials.

It has indeed been admitted by physiologists that humic acid, in its unaltered condition, cannot serve for the nourishment of plants; and hence they have assumed that the lime, or the different

alkalies, found in the ashes of vegetables, render solublo the humic acid, and fit it for the process of assimilstion. But even supposing the humic acid to be absorbed by plants in the form of that salt which contains the largest proportion of humic acid —namely, the humate of lime, Licbig shows, from the known quantity of the alksline bases contained in the ashes of plants, in relation to the carbon they contain, that not so much as 1-30th of the carbon of fir-wood, nor so much as 1-20th of the carbon of wheat straw, could be derived from humus in this way.

2d. Humate of lime requires 2500 parts of water for solution. Now, supposing all the rain water which falls upon a field to become saturated with humate of lime, and to be absorbed by the plants growing upon it, then the quantity of humate of lime which the plants thus nourished could obtain may be calculated. But it proves to be quite insufficisnt to account for the carbon contained in the corn or in beet-root grown upon the land.

3d. A certain quantity of carbon is taken every year from a forest or meadow, in the form of wood or hay, and in spite of this the quantity of carbon in the soil augments: it becomes richer in humus.

The carbon of plants must therefore be derived from other sources, and as the soil does not yield it, it can only be extracted from the atmosphere. Physiologists in attempting to explain the origin of carbon in plants, overlook the circumstsnce that the question is intimately connected with that of the origin of humus. It is universally admitted that humus arises from the dccay of plants. No primitive humus, therefore, can have existsd, for plants must have preceded the humus.

That plsnts derive the *carbon* exclusively from the decomposition of carbonic acid, chiefly and often entirely supplied by the atmosphere, is the conclusion to which Liebig arrives. They rsstore oxygen at the same time to the atmosphere, agreeably to the observation of Priestley, De Saussure, and others. The decomposition of carbonic acid, it is true, is arrested by the absence of light, and then plants appear to produce and evolve carbonic acid But then, namely, at night, according to Liebig, a truly chemical process commences, in consequence of the action of the oxygen in the air upon the organic substances composing the leaves, blossoms, and fruit. This process is not at all connected with the life of the vegetable, because it goes on in a dead plant exactly as in a living one, The formation of acids is effected during the night by a true process of oxidation; the volatile oils also change into resins by the absorption of oxygen. The carbonic acid, which has been absorbed by the leaves and by the roots, together with water, ceases to be decomposed on the departure of day-light: it is dissolved in the juices, which pervades all parts of the plant, and escapes through the leaves by evaporation. Plants, which live in a soil containing humus, exhale much more carbonic acid during the night than those which grow in dry situations—the decomposition of the humus in the soil affording additional carbonic acid to the roots of the former.

The opinion is not new that the carbonic acid of the air serves for the nutriment of plants, and that the carbon is assimilated by them, having been advocated by the ablest Natural Philosophers, but has not been properly appreciated by Natural Philosophers, partly, Liebig believes, from their imperfect acquaintance with chemistry, and partly from certain objectionable experiments which were instituted by them in order to decide the point. That the development of the plants growing from seeds sown in pure Carrara marble and in sulphur, did not advance far, although sprinkled with carbonic acid water, is not to be wondered at, seeing that many conditions are necessary for the life of plants: those of each genus requiring special conditions, and should but one of these be wanting, although all the rest be supplied, the plants will not be brought to maturity. The sources of the nitrogen and earthy bodies, which all plants contain, were withheld in these experiments. The mere observation of a wood or meadow, Liebig considers infinitely better adapted to decide the question, than all the trivial experiments under a glass globe.

Having shown that the carbon of plants is derived from the atmosphere, Liebeg next inquires what power is really exerted in vegetation by the humus of the soil.

Woody fibre, in a state of decay, is the substance called *humus*. This body possesses the property to convert oxygen into carbonic acid. A substance then remains, *mould*, which is the product of the complete decay of woody fibre. It constitutss the principal part of all the strata of brown coal and psat. *Humus is a continued source of carbonic acid*, which it emits very slowly. Such is the chief function which Liebeg ascribes to it in vegetstion. There is no reason to believe that *humus*, if absorbed by plants, would be assimilated more than sugar, starch, and gum, which humus considerably resembles, and which, when absorbed by the roots of plants, are not assimilated, but again discharged by the roots, or excreted by the leaves. Cultivation is useful, as tilling and loosening the soil allows access of air to the humus, and thus gives rise to the formation of carbonic acid. When a plant is quite matured, and when the leaves, the organs by which it obtains food from the atmosphere, are formed, the carbonic acid of the soil is no further required.

The Assimilation of Hydrogen.—The solid part of plants (woody fibre) contains carbon and the constituents of water, or the elements of carbonic acid, together with a certain quantity of hydrogen. The wood may be formed from a combination of the carbon of the carbonic acid with the elements of water, under the influence of solar light, the oxygen of the carbonic acid being at the same time evolved. Or, and this view Liebeg thinks more probable, plants under the same circumstances, may decompose water, the hydrogen of which is assimilated along with carbonic acid. The oxygen disengaged from plants will therefore come from water. But the volume of this gas set free would be the same, whether derived from the decomposition of carbonic acid or of water. A part or the whole of the oxygen besides, contained in the carbonic acid, must also be set free, in the formation of such a substance as an essential oil, which contains only a small portion of oxygen, or no oxygen, as a constituent.

On the Origin and Assimilation of Nitrogen.—Professor Liebeg established the fact that the third of the organic elements is uniformly derived by plants from *ammonia*. Like water, that body admits of numerous transformations, in contact with other bodies. He has demonstrated the existence of ammonia in the atmosphere, by original experiments, having obtained it in minute but sensible quantity from rain water collected at a distance from all habitations. The diffusion of this substance in the mineral kingdom is also evinced by the existence of calcareous nitre soils and rocks, there being good reason to consider nitric acid as a prodnct of the transformation of the former. A salt of ammonia also sublimes with the boracic acid, condensed in the hot boracic lagoons of Tuscany. Ammonia is also observable in the state of a salt in the juices of plants. The juice of the maple tree and of beet root are found, in the process of preparing sugar from them, to contain ammonia in considerable quantity. Purified urine contains nitrogen in the forms of carbonate, phosphate, and lactate of ammonia, and in no other form. It is employed in Flanders as a manure with the best results. Animal manure, Liebig believes to act only by the formation of ammonia. The latter substance must also form the red and blue coloring matter of flowers.

The evident influence of Gypsum upon the growth of grasses, the striking fertility and luxuriance of a meadow upon which it is strewed, depends only upon its fixing in the soil the ammonia of the atmosphere, which would otherwise be volatilised with the water which evaporates. The ammonia, which is in the state of carbonate, is then decomposed, as in the manufacture of sal ammoniac, and the sulphate of ammonia produced.

The advantage of manuring fields with *burned clay*, and the fertility of ferruginous soils, which have been considered as facts so incomprehensible, are explained in an equally simple manner. The true cause is this:—The oxides of iron and alumina are distinguished from all other metallic oxides by their power of forming solid compounds with ammonia. The ammonia is separated from them by every shower of rain, and conveyed in solution to the soil.—*Powdered charcoal* surpasses all other substances in the power to absorb ammonia and other gases, and has been observed to promote vegetation in an extraordinary degree. Decaying wood possesses the same property. Humus, therefore, is not only a slow and constant source of carbonic acid, but is also a means by which the necessary nitrogen is conveyed to plants.

Nitrogen, Liebig observes, is found in lichens, which grow on basaltic rocks. Our fields produce more of it than we have given them as manure, and it exists in all kinds of soils and minerals which were never in contact with organic substances. The nitrogen in these cases could only have been withdrawn from the atmosphere.

Carbonic acid, water, and ammonia, contain the elements necessary for the support of animals and vegetables. The ssme substances (he adds) are the ultimate products of the chemical processes of decay and putrification. All the innumerable products of vitality resume, after death, the original form from which they sprung. And thus death—the complete dissolution of an existing generation —becomes the source of life for a new one.

But another class of substances are also necessary for the life of vegetables.

The Inorganic Constitution of Plants.—These substances are found in the ashes left after tho incineration of plants, although in a changed condition. Many of these inorganic constituents vary according to the soil in which the plants grow, but a certain number of them sre indispensable to their development.

Phosphate of magnesia, in combination with ammonia, is an invarisble constituent of the seeds of all kinds of grasses. Plants also contain various orgsnic acids, all of which are in combination with bases, such as potash, soda, lime, or magnesia. Of the different alkaline bases found in plants, Liebig finds reason to conclude, that any one may be substituted for another, the action of all being the same. But the number of equivalents of these various bases remains the same. The analysis of Berthier and Saussure show that the nature of a soil exercises a decided influence on the quantity of different metallic oxides contained in the plants which grow upon it: that magnesia, for example, was contained in the ashes of a pine-tree, grown at Mont Breven, while it was absent from the ashes of a tree of the same species from Mont La Saile, and that even the proportion of lime and potash was very different. But although the composition of the ashes of these pine-trees was ao very different, they contained an equal number of equivslents of metallic oxides; or, what is the same thing, the quantity of oxygen contained in all the bases was in both cases the same—being expressed by the number 9.01 in one case, and by 8.95 In another, a coincidence which had escaped the notioe of the analyst himself. It is certain that particular acids exist in different vegetables, and are necessary to their life; some alkine base is also indispensable, in order to enter into combination with the acids, which are always found in the state of salts.

The perfect development of a plant is therefore dependent on the presence of alkalies or alkaline earths, and its growth is arrested when these substances are totally wanting, and impeded when they are ouly deficient. Hence it is that of two kinds of tree, the wood of which contains unequal quantities of alkaline bases, one may grow luxuriantly in several soils, upon which the other can scarcely vegetate. Thus 10,000 parts of oak-wood yield 250 parts of ashes, and the same quantity of fir-wood only 83 parts. Hence, firs and pines find a sufficient quantity of alkalies in granite and barren sandy soils, in which oaks will not grow. Liebig supplies various additional illustrations of

the influence of the alkaline metallic oxides on vegetation, amply sufficient to place beyond controversy these conclusions so important to agriculture and to the cultivation of forests. One of these I may quote: a harvest of grain is obtained every thirty or forty years from the soil of the Luneburgh heath, by strewing it with the ashes of the heath plants which grow on it. These plants during the long period mentioned collect the potash and soda from the decomposing minerals of the soil, which are conveyed to them by rain-water; and it is by means of these alkalies that oats, barley, and rye, to which they are indispensable, are enabled to grow on this sandy heath.

The supposition of alkalies, metallic oxides, or organic matter in general, being produced by plants, is entirely refuted by such well-authenticated facts.

It is thought very remarkable, that those plants of the grass tribe, the seeds of which furnish food for man, follow him like the domestic animals. But none of our corn plants can bear perfect seeds, that is, seeds yielding flour, without a large supply of phosphate of magnesia and ammonia, substances which they require for their maturity. Hence these plants grow only in a soil where these three constituents are found combined, and no soil is richer in them than those where men and animals dwell together.

Professor Liebig then applies these great fundamental principles, in this report, to the *art of culture* under the heads of—use of humus, nutrition, and growth of plants, necessity of azotised substances, influence of the food on the produce, composition of soils, the fertility of soils, fallow. Then, under the head of interchange (rotation) of crops and manure, he discusses the varieties and applications of particular manures, composition of animal manures, the essential elements of manure, bone manure, manure supplies nitrogen, mode of applying urine, value of human excrements.

In the second part of his report, Professor Liebig discusses the chemical processes of fermentation, decay, and putrefaction, under the heads of chemical transformations—vinous fermentation—wine and beer—decay of woody fibre—on the mouldering of bodies—and on poisons, contagious matter, and miasma.

The novel theoretical views with which this department of the work abounds, are remarkable, equally with those of the preceding part, for their profundity and for their valuable applications. The subjects discussed, however, are numerous, and of such a nature that great injustice would necessarily be done to them in a short and hasty abstract.

SCIENTIFIC MEMORANDA, AND NOTES ON ART.

Temperature of the Earth at Great Depths.—An interesting experiment was made last year, by Messrs. Arago and Walferdin, to ascertain the temperature of the Artesian well at Grenelle. At a depth of 481 metres, it gave a result of 27 deg. ·05 centigrade, equal to 82 deg. of Fabrenheit. It was apprehended, however, that this indication was too high, and that there had been some increase to the natural temperature of the earth, owing to the friction of the tools and the rubbing of the metal case, which held the thermometer against the sides of the bore. Messrs. Arago and Walferdin have recently repeated the experiment with increased care. They let down six thermometers of different constructions. After they had remained at the bottom seven hours and a half, at a depth of 505 metres (equal to about 1,600 feet), the thermometers indicated a temperature of 26 deg. ·23 centigrade; equal to 80 deg. Fahrenheit.

Injurious Effects of Black Paint.—The following is abridged from a paper on this subject by Mr. L. Thompson, published in the Transactions of the Society of Arts:—"There is nothing," he observes, "which will prove the injurious effects of black paint, more than by observing the black streaks of a ship after having been in a tropical climate for any length of time. It will be found that the wood round the fastenings is in a state of decay, while the white work is as sound as ever: the planks that are painted black will be found split in all directions, while the frequent necessity of caulking a ship in that situation likewise adds to the common destruction; and I am fully persuaded, that a piece of wood painted white will be preserved from parishing as long again, if exposed to the weather, as a similar piece painted black, especially in a tropical climate. Wood having a black surface, will imbibe considerably more heat in the same temperature of climate, than if that surface was white: from which circumstance we may easily conclude, that the pores of wood of any nature will have a tendency to expand, and rend in all directions, when exposed under such circumstances. The water, of course, being admitted, causes a gradual and progressive decay, which must be imperceptibly increasing from every change of weather."

A Company has been formed at Calcutta, for establishing two Steam Ferry Boats upon the river Hooghly, with chains upon the principle of Mr. Rendel's floating bridges at Plymouth, Portsmouth, and Southampton; and orders have been sent to this country for their purchase.

Brandy from Potatoes.—M. Siemens, a Polish professor, has invented an apparatus, by means of which, he can obtain brandy in an hour's time, from boiled potatoes. This process, which is very economical, is about to be employed in the army.—*Courrier du Bas-Rhin.*

Eclipses.—In the year 1841 there will happen six eclipses, viz.:—four of the sun, and two of the moon, out of which number, one only of the latter, will, however, be visible at Greenwich.

Royal Colleges in France.—The establishment of a Royal College, with 20 bursarships, has just been authorised by the King at Angouleme, and the ordonnance to that effect is published by the *Moniteur*. M. Adam Mickiewiez, the Polish poet, and professor of languages in the Academy of Lausanne, has been appointed professor of the Sclavonic languages and literature in the College de France. The *Moniteur*, in noticing this appointment, observes that this gentleman knows all the languages of the Sclavonic family in the most perfect manner, and that he may be called the Byron of Poland.

Course of Sea Currents.—A bottle containing the following memorandum was picked up on the east coast of Trinidad on the 5th of May:—"This bottle was put overboard, March 18, 1840, on the equator, long. 39 05 W. from Greenwich, from the bark Coosa, from Rio Janiero for Philadelphia. By the above it will be seen that this bottle in the space of 48 days was carried in a south-easterly direction at the rate of 31 miles per day, or nearly 1,500 miles.—*New York Paper.*

Niger Expedition.—On Saturday last Her Majesty's steam-vessel Wilberforce, the third iron vessel built by Mr. John Laird for this expedition, was launched from his yard, North Birkenhead. She is expected to be ready for trial in three weeks. The Albert, Captain Trotter, R.N., and Soudan, Commander Bird Allen, R.N., the other two steam-vessels for the same expedition, are, we understand, nearly ready for sea.—*Liverpool Albion.*

Relics of the Royal George.—Since our last notice of these operations, the work has been steadily progressing, Mr. Fullagar, one of three divers constantly employed at every slack tide, slung a 12 pounder brass gun, which was got up on the 24th of September; and the others have been no less active and successful as to quantity, though not so fortunate in respect to value. A considerable number of planks, and pieces of large beams and floor timbers, have been got up, several of which being buried one or two feet below the surface of the mud, gave a good deal of trouble to the divers, who were obliged sometimes to use the shovel to dig round them. It has been ascertained, by comparing the soundings taken by Lieutenant Symonds, on the 8th August, with those of the 8th of October instant, that the shoal, or mud bank, in which the remains of the wreck and guns are buried, has been diminished by at least one-third within this period, especially at the east end, where the first large charge of this year was fired, partly by the gradual but efficient action of the tides, and partly by the use of the rake, and also of a sort of creeper adopted more recently. Amongst the curiosities recovered have been some of the surgeon's implements, the brass pans of his scales being perfect, though very thin, as well as the brass chains by which they were hung, but with all the iron work gone. Next to brass, the most durable article found has been silk; for besides pieces of cloaks and lace, a pair of black satin breeches, and a large satin waistcoat with flaps, were got up, of which the silk was perfect, but the lining entirely gone, as well as the buttons, from the thread giving way. No articles of dress of woollen cloth have yet been found, and therefore we may presume that they have all decayed. Some pieces of leather have been recovered from time to time, but none in a perfect state.—*Hampshire Telegraph.*

Character of a Fine Dahlia.—Dahlias are distinguished by the three criteria of form, colour, and size. *Form*—The front view of the blossom should be perfectly circular, without notches or inequalities, caused by the petals being pointed, and not as they should be, rounded, smooth at the edges, and slightly concave, but not so much as to show any of the back. One of the most perfect flowers in this respect is the Springfield Rival. When the petals are pointed, notched, fringed, piped, quilled, concave, convex, or flat, the perfectness of the circle is broken, and one indispensable beauty to the eye of the florist is deficient. When the eye or disk is shown in the full-blown flower, it is also a striking defect. The side view of a first-rate flower should be that of a perfect hemisphere. There is perhaps no example of this perfection of form without some slight deficiency. The Countess of Liverpool is one of the nearest to a perfect flower in this respect. *Color* is looked upon by Florists as a minor consideration to form, though it is usually the first to attract the notice of common observers. In flowers of one color, or selfs, the color ought to be bright and distinct, without any breaking or blotching. When there are stripes, motlings, shadings, or edgings, these should be clear and uniformly marked, the colors distinct without clouding or running. Although large flowers with superior form and clear distinct colors are held in higher estimation than small flowers with like properties, yet size alone is looked upon by Florists as of no importance when form and color are defective.—*Trans. Hort. Soc. Pennsylvania.*

The Medical Schools.—We believe that the whole number of medical pupils who have this session entered at the metropolitan schools is considerably less than it has been for some years past. A gradual but slow decrease has been observed for several sessions, as the result of which we have noticed the closing of some of the smaller schools; but this year the diminution of the number of students is more considerable, though the loss, having fallen in nearly equal proportions on all the schools, is not materially felt by any of them. Many circumstances may be assigned as the causes of this change. The alterations made in the scheme of education required to the Apothecaries' Company a few years since, and the fears that other changes would soon follow, of which the tendency would be to render the attainment of the license still more tedious and difficult, might induce some students to repair very early, not to say prematurely, to London, that might be secured from the effects of alterations made subsequently to the date of their entrance to lectures. Thus, while there would be an excess in the pupils of those years, there might be expected a comparative deficiency of those of the present. And in the same manner the unsettled state of the regulations of the College of Surgeons may be supposed to have exerted a similar influence; or, still more, their late arrangement, by which candidates for the diploma are not required to have received any part of their medical education in London, may be believed to have already operated to the disadvantage of the London schools. It may be that each of these circumstances has had some influence; but we feel assured that the cause of the decrease of London students has a much deeper origin, and that it is only a sign, though the best that can be afforded, that the whole number of persons entering the profession of medicine is annually becoming less.—*Medical Gazette.*

Steam Carriage Trip.—A short time ago, we noticed a successful experiment made with Mr. Squire's steam-carriage for common roads, and since then we have, in company with several scientific men, had an opportunity of ascertaining its facilities by personal experience. We are necessarily brief in stating the results of our observations. The speed attained on spaces of ground including planes of considerable elevation varied, both in advancing and returning, from fifteen to twenty miles per hour. The carriage, which is merely a temporary construction to enable the workmen to perfect the machinery, and resembles an omnibus, turned the sharpest corners with more precision than a coach drawn by four horses. Carts, carriages, and other obstacles always encountered on the highways were avoided with a nicety which the most experienced *whip* might envy. The engine being tubular, precludes apprehension of danger from explosion, and by the arrangement of the springs the motion is easy, and totally devoid of that tremor which renders most locomotive vehicles unpleasant. We may notice that the supply pumps worked by hand might be connected with the engine, and the pipe be of larger calibre. All expressed themselves satisfied.—*Courier.*

Canal Steam Navigation.—The experimental steamer, at present on the Forth and Clyde Canal, was lately docked for the purpose of making certain alterations on the propeller. On the former occasion the floats were fixed at an angle of 45 deg. to the shaft of the propeller, which gave, of course, a progressive motion from six feet in each revolution, the diameter of the propeller being two feet. On the present occasion, the floats were placed on the shaft at a more obtuse angle, so as to reduce the progressive motion from six to four feet. On Friday week, the boat was got under way from Lock 16. To conduct to a satisfactory conclusion, of course, the pressure of steam in the boiler was made the same as on the first experiments, viz., 54lbs. on the square inch; and the result of this change in the angle of the floats to the shaft, was found to be an acceleration of speed of 20 per cent., or rather more, as compared with the first experiments. That is, when the floats were placed at an angle of 45 deg. upon the shaft, the speed was found to be five miles an hour; now, when the angle was rendered more obtuse so as to produce four feet progressive motion, it is found that the speed was at the rate of six miles an hour. The result was extremely satisfactory to all the gentlemen present, confirming, as it did, their former anticipations; and the boat has again been laid up preparatory to other alterations which are contemplated, in order, experimentally, to demonstrate the most efficient angle at which the floats should be placed upon the propelling shaft. —*Paisley Advertiser.*

British Museum.—Last week the new eastern Zoological Gallery at the British Museum was opened partially to the public, and when this is completed, and the adjoining one opened, this establishment will contain the most beautiful zoological collection in Europe. The former contains the Passerine Gallinaceous and wading birds, and the former being smaller birds, are arranged so that there is a light ground immediately behind each, which gives a good effect in relief. The gallery, which is 300 feet long, fitted up with bronze door frames and large panes of plate glass, is one of the most magnificent rooms ever devoted to a zoological collection. The collection has lately been enriched by some birds from Russia, which have never before been seen in the west of Europe.

Italian Scientific Assosiation.—This learned body, formed on the principles of the British Association for the Advancement of Science, has just terminated its second sittings at Turin. The proceedings were divided into six lectures, viz.:—1. Medical; 2. Geological; 3. Physical, Chemical, and Mathematical; 4. Agronomical and Technological; 5. Botanical and Vegeto-Physiological; and 6

Zoological. The proceedings were generally of high interest, and geological and zoological excursions were made to different places in the vicinity of Turin. At the next meeting the department of chemistry will form a separate lecture.

Museum of Economic Geology.—The Government Museum of Economic Geology and Depository for Mining Records, at Craig's-court, Charing-cross, is in a great state of forwardness, and will open early next spring. The attention of agriculturists will be particularly invited to the laboratory, where soils will be analysed at a very moderate cost.

VARIETIES.

Price of Iron.—The quarterly meeting of the Staffordshire iron-masters took place last week, when the price of iron was advanced 18s. per ton for pigs, and 20s. per ton for bars. The quantity of iron manufactured in Staffordshire is about 600,000 tons.

Severn Navigation.—At length, it would seem, there is a probability of effecting this long projected and most important scheme. The dissolution of the old Company having set aside many difficulties and objections in the progress of the measure, and the principle of a Commission being prepared to be adopted, the matter we hear is now taken up by many most influential parties, with a thorough determination to carry it through; and there is no doubt, if they act with vigor, they will easily succeed in obtaining the consent of the Legislature.—*Worcester Journal.*

Irish Cattle.—The following is the number of Pigs, Sheep, Cattle, and Horses, imported into Bristol from Ireland, during the last six months:—Pigs, 39,380; Sheep, 6,578; Cattle, 2,458; Horses, 381.

Swiss and Dutch Treaty of Commerce.—The *Basle Gazette* of the 2d instant says,—"The treaty of commerce, which has been just concluded with Holland, has been submitted for ratification to the States. According to article 2 the King of Holland extends to all the products of the soil and manufactures of Switzerland, on their importation into his states, the advantages possessed by the most favored nations. The confederation, on the other hand, binds itself not to augment the present duties upon Dutch merchandise. The treaty, which is only provisional, is to remain in vigor till the end of January, 1841."

Mdlle. Mars has positively announced her retirement from the French stage, which is to take place on the 1st of April next. The celebrated actress will previously play the round of her chief characters.

Large Fuschia.—There is at present in the garden of Mr. D. Bell, Craigmore, near Rothsay, a magnificent fuschia, about eight feet high and forty-two feet in circumference. This very large specimen has only been planted about four years, and remains exposed in the open air all winter, a proof of the mildness of the climate of the Island of Bute.—*Scottish Guardian.*

The Steam Ship Orientat.—This ship has returned to Liverpool, after a most successful voyage. The vessel performed the whole distance out and home in 36½ hours less than the contract time. During the passage out she had to steam the whole distance from Falmouth to Cape Finisterre against a strong head breeze and heavy head sea. Off the coast of Portugal had thick foggy weather. From Gibraltar to Malta, the first three days, strong head wind and heavy head sea; remainder moderate and clear. Malta to Alexandria variable and clear. Homeward passage, moderate and generally favorable weather, but steamed with inferior coals taken at Malta.

Schools of Design in Spitalfields.—On Monday night a meeting of Spitalfield weavers took place, for the purpose of taking into consideration the report of a committee appointed on the 21st of July, with a view to the production of a piece of workmanship worthy to be presented to the Queen. The committee was also to report its opinion on the subject of establishing a permanent school of design in the neighborhood of Spitalfields. The report stated, that the committee had attempted an experiment in silk manufacture, the design of which would be entirely new, and they hoped by that to obtain a lasting benefit for the rising generation. But the committee had not confined their labors to that object alone, as they hoped by the means they had devised to establish a school of design, which would tend to develop constantly new inventions, so that their silks might always command a trade. A new species of Jacquard machine had been invented by a Frenchman, who had long resided among them, which for conciseness and just mechanical principle had excelled everything hitherto invented of that description of machinery. In addition to this report a memorial was also read to the meeting, which the committee had addressed to the trade generally, calling their attention to the means which in this country were resorted to by those interested in the success of foreign manufacturers, and the memorialists at the same time pointed out the great advantages which the French manufactures derived from periodical exhibitions, contending that a similar practice would be attended with most beneficial results in this country.

Hints to Railway Travellers.—The following "hints" are given by a correspondent of the *Morning Post*, who signs himself "An Old Railer."—1. Never travel by night. 2. Occupy the centre seat in the centre division of the centre carriage of the train. The motion is less: you cannot thrust your arms or head out of the window; the majority of travellers choose the seat next the window; it is, consequently, an even chance you can rest your legs on the seat opposite: if the carriage is upset, you are not so liable to be cut by the glass, and it is not quite certain you will be "literally smashed to pieces." [The expression used in describing a late accident] 3. Always compel porters to place your luggage on the roof of the carriage that contains you; any small parcel under your seat: if active, you will be able to keep possession of your own on arrival at your destination. N.B Take away no luggage but your own. 4. Never go by the *first* morning train. If any obstruction, or if any embankment has been washed away in the night, this is the train to discover such *malheur*. 5. Always select the fast train—the word "fast" only signifying better conducted, and that you stop four instead of fourteen times between London and Birmingham. 6. Avoid the society of old nurses and their accompaniments as you would the plague. If you cannot change your carriage, go by another train. 7. Be very careful what you eat at Wolverton. Avoid pork-pies especially; few pigs brought up in the neighborhood. 8. Always arrive at the station half an hour before the time. You can then choose your seat, and guard against being locked up in a wrong carriage. 9. Should Prince Albert be going or coming, pray that his Royal Highness be punctual. 10. Never pay the servants of the establishment: do not fail to complain of incivility or insult. 11. Never smoke: never sleep. 12. If you hold shares, sell them.

Steam Vessels fitted as Ships of War.—We were the first to call attention to the great advantages which this country would derive, in case of war, from the numerous fleet of steam-boats she possesses, which might be readily adapted as war steamers. The subject has since been taken up and enforced in other journals, and the French too have seen the importanee of such an adaptation, and have provided that the transatlantic steam-ships to be built in that country shall be constructed with a view to warlike purposes as well as commercial. A correspondent of the *Morning Herald* on Thursday observes, on this subject:—"The numerous steamers which trade between the port of London and various places could be made available for the purposes of war at a very short notice, and if only one-third of the steam-ships belonging to the river Thames were to be armed, and provided with ammunition, in the event of hostilities commencing, a powerful fleet could be sent against the enemy, while their captains and crews, from their knowledge of the English, Dutch, and French coast, the channel, &c., would be very serviceable. The Admiralty have had their attention drawn to this, and have been recently making inquiries into the condition of the steam-vessels, and their capabilities for war, from which it appears that the various companies, without any interruption to their general trade, could provide 50 steam-vessels of from 200 to 1,200 tons burden, which, in three weeks, could be converted into men of war. The General Steam Navigation Company have the largest fleet of steamers of any trading community in Europe, amounting in all to 40 sail, and among them are many splendid vessels, including the Monarch, equal to any steamship in her Majesty's service; the Clarence, Giraffe, Ocean, Neptune, Britannia, Countess of Lonsdale, Attwood, Soho, and others; which could be easily converted into war steamers, and make a very formidable display. We believe the General Steam Navigation Company have intimated to the Government that they could provide them with a dozen large steam-ships on an emergency, and from this it will be seen that the port of London alone, independently of Liverpool, Hull, Glasgow, and other places, could furnish steam-vessels sufficient for the navy if Great Britain should be called upon to defend herself against foreign aggressions."

The Vintage in France.—The *Moniteur* announces that the vintage is terminated in almost the entire of Upper Burgundy, in the environs of Magon, of Villefranche, and Beaujean. In Lower Burgundy and Anjou, and on tha banks of the Cher and the Loire, it is not yet finished. Almost everywhere the quality is excellent; and the general opinion is, that the vintage of 1840 will be equal to that of 1834, the produce of which year was remarkable for maturity, body, and fineness of quality. The district of Champagna promises also wines of a remarkably fine quality, though in Cramant, Lemenil, Epernay, St. Martin, &c., the vintage took place under heavy and continued rains.

Import Duties.—The Report of the Committee to inquire into our Import duties, shows that our Custom's duties, revised in the 3d and 4th of the late KING, exhibit no fewer than 1,150 different rates of duty chargeable on imported articles, all other commodities, when imported, paying duty as unenumerated. Seventeen articles produce 94½ per cent. of the whole revenue, and twenty-nine other articles produce 3 9-10ths, so that 98 2-5ths per cent. of the revenue are obtained by the Custom's duties on forty-six articles. The duties on all the other articles together only produce 363,319*l.* What an immense mass of vexation is comprised in these restrictions on importation for a most petty sum! What books, and clerks, and tide-waiters, are required to watch after the surreptitious and open importation of more than 1,100 commodities, which yield less than 400,000*l.*! What writing and watching, what checks and counter-checks, what honesty in subalterns and vigilance in Commissioners, and what restrictions on the free actions of many hundred thousand people; what trouble to merchants and ship-captains, what pains and penalties all who frequent the water are liable to, merely to levy such a driblet of the national resources as 363,319*l.*—*Sun*, Oct. 15.

Literature, Music, and War.—The Welch literary and musical meeting at Abergavenny came off on Wednesday and Thursday. On the former day there was a long procession of the various societies taking an interest in the objects of the meeting, conducting to the place of assembly the President of the day, Mr. J. W. Rolls, and a long train of carriages, containing the principal gentry who patronized and supported the design. This procession was accompanied *by the band of the Rifles, and escorted into and through the town by a troop of the Scotch Grays*, now quartered at Abergavenny. The meetings, which were held in a spacious building called the Pavilion, erected for the occasion, went off with great spirit, and a number of honorary and pecuniary rewards were distributed among the various candidates for these literary and musical prizes. The competitions for the triple harps, and the gold harp of Tredegar, excited peculiar interest, particularly among the ladies, many of whom were dressed in the costume of the country, and wore the silver leek.—*Cheltenham Looker-On*

National Debt.—The *Gazette* of Tuesday contains an announcement from the Lords of the Treasury, that the actual expenditure of the United Kingdom of Great Britain and Ireland exceeded the revenue for the year ended the 5th of July last, by 1,204,121*l.* 6s. 5½d.

Clevetand Hills.—A company of sappers and miners have been appointed by Government to make a survey of the Cleveland-hills. They have been busily engaged for the last ten days on Eston-nab, Easby-hills, and Roseberry-topping, to the no small alarm of the peaceful peasantry and villagers in the surrounding districts.—*Newcastle Journal.*

The Theatres.—Drury Lane Theatre opened for the season on Monday; not, however, for dramatic performances, but for *Concerts d'Hiver*. The arrangements for the accommodation of the public have been considerably enlarged since last summer and adapted to the change of season. There are ninety performers, including many of first rate eminence. M. Nabaud of her Majesty's Theatre leads the band: M. Musard is the conductor.

East India Trade.—Mr Stikeman, the secretary of the East India and China Association, has prepared a comparative statement of the number of British ships, with their tonnage, entered into and cleared outwards from and to places within the limits of the East India Company's charter, from the 1st of January to the 30th of September, 1839, and 1840. By this statement it appears that the tonnage inwards for the first three quarters of last year was 182,582, while that for the same period in the present year is 185,594, giving an increase of 3,012 tons, and that the ships during similar periods are 474 for last year and 467 for the present, giving a decrease of seven ships. In 1839 the ships entering the London port during this period were 348; this year they are only 324, which is a decrease of 24, while in Liverpool they have increased from 95 to 107, and in other ports there has also been an increase. The tonnage outwards for the same periods is 215,809 for 1839, and 273,853 for 1840, and the number of ships is 542 for the former and 702 for the latter, giving an increase of 58,044 tons and 160 ships. However, with respect to the number of tons cleared for China and the Cape of Good Hope, it has decreased; 5,020 for the former, and 1,870 for the latter. The increase is attributed to the sending troops to India, and emigrants to Australia.

ADVERTISEMENTS.

WILDEY & COMPANY'S PATENT COCOA-NUT FIBRE, for Stuffing Mattresses, Couches, Carriages, and all kinds of Furniture. The natural properties of this material are durability, elasticity, cleanliness, salubrity, and cheapness; being LESS THAN ONE-THIRD THE PRICE OF HORSE-HAIR. It is a non-absorbent, and a powerful anti-contagionist, AND NO VERMIN OF ANY KIND WILL LIVE IN IT. The Patentees' Offices are at 3, Agar Street, Strand, where samples may be seen.—N.B. A liberal allowance to the Trade.

HALL'S HYDRAULIC BELT, or WATER ELEVATOR.—Extract from the public press, 28th September, 1840.—"The British Association, Glasgow, Tuesday, Section G., mechanics, Sir John Robison in the chair. Mr. Fairbairn explained 'HALL'S Hydraulic Belt for Raising Water.'"

Prospectuses may he obtained at the Offices of Mr. Bebb, Solicitor, 20, Great Marlborough-street, Regent-street, London.

POTTS' PATENT PICTURE RAIL MOULDING, AND APPARATUS FOR SUSPENDING PICTURES.

The unqualified approbation which the above invention has received, satisfies the patentee that he has succeeded in his object of endeavoring to establish a convenient system for hanging pictures, uniting economy with elegance and utility. The rail can ha adopted to form the bottom member of the cornice, and supersedes the expense of a gilt moulding; it will carry the largest pictures without the least inflection, and can be easily fixed up in any room, even after decoration, without damage to the walls.

The public is invited to inspect specimens, which may be seen daily at 17, King William-street, Strand.

INSTANTANEOUS LIGHTS.

JONES'S PROMETHEANS.—Tha advantages the Prometheans possess over all other instantaneous lights, are their extreme simplicity and durability, as neither time nor climate can impair their original quality. They are composed of a small glass bulb hermetically sealed, containing about a quarter of a drop of Sulphuric Acid, encompassed by a composition of the Chlorate of Potash, enclosed in Wax Papers or Wax Tapers; tha latter will burn sufficiently long for sealing two or three letters. The PROMETHEANS being pleasant to use, and never failing in their purpose, are rendered nearly as cheap as the common Lucifers. To be had of all respectable Chemists, &c., or at the Manufactory, 201, Strand.

THE CIVIL ENGINEER and ARCHITECT'S JOURNAL, SCIENTIFIC and RAILWAY GAZETTE; No. 37, for October, price 1s. 6d.; contains—Drawings and Description of the Reform Club House—Papers on Architectural Competition—Candidus's Note Book—On Cuttings and Embankments—Greek and Roman Art—Public Buildings, by Ralph—Stone for the New Houses of Parliament—Firing Blasts under Water—Felling Timber—Tide Guage—Ystaly-fera Anthracite Iron—Improvement of Lough Erne, Ireland—Iron and Timber-built Ships—Report of the British Association—Reviews of New Books—Proceedings of the Institution of Civil Engineers—List of New Patents—and numerous professional communications and remarks.

H. Hooper, Pall Mall East; and Groombridge, Panyer Alley, Paternoster Row.

THE RAILWAY MAGAZINE, AND COMMERCIAL JOURNAL. By JOHN HERAPATH, Esq. Mines, Steam Navigation, Banks, Canals, Docks, Assurances. Published Weekly, price FIVE-PENCE Stamped, at Half-past Six on Saturday Mornings.—This long-established work (the oldest Railway periodical), being independent and wholly free from sinister influences, contains full and accurate Reports of all Railway Meetings, with Directors' and Engineers' Reports, and all information relating to Railways; unique Share Lists for London and Liverpool, &c.; the best Tables of Traffic extant, &c. Amongst other exclusive matter is the *Times of Starting of all Railway Trains*, giving most important information for travellers and commercial men. This Paper, which has the largest circulation of papers devoted to Mining, contains *Weekly Reports of Mining Companies*, exclusively furnished to it; Reports of the Meetings, Prices of Metals, Mining Intelligence, &c. For intelligence relating to Steam Navigation, the Magazine has long been known. It gives every week a *Steam Vessel Tide Table*, showing the time of tide every day for every port in England. On *Banking, Life Assurance, &c.*, much valuable original matter has been given in the Magazine, as well as upon all subjects relating to Joint Stock Companies. Accounts of new Companies, List of Meetings, Calls and Dividends, Share Lists, &c. Many original articles and much exclusive information are given on Scientific and Mechanical subjects, with occasional Engravings, Reviews, &c. As a medium for *Advertisements*, the "Railway Magazine and Commercial Journal," from the nature of its circulation, possesses peculiar advantages. Among the Advertisements which are inserted in this paper are—Companies.—Railway, Mining, Asphalte, Steam Navigation, Banking, Life, Fire, and Marine Assurance, Canal, Dock, Gas, Water-work, Cemetery, Paving, Dry Rot, and all Joint Stock Companies; Discount and Loan Societies. Sales of Shares, Landed Property, Collieries, Mining Materials, Iron Works, Foundries, Factories, Steam Engines, Actions, Contracts:—Public Works, Books, Travelling:—Railway Trains, Coaches, Steam Boats, Hotels, Patent Inventions. Engineering and Mining Colleges, Scientific Institutions, Exhibitions, &c.—Published at 3, Red Lion Court, Fleet Street, and to be had of all Booksellers and Newsmen.

THE SHIPPING AND MERCANTILE GAZETTE, London Evening Journal of Maritime, Commercial, and Political News,—combining all the essentials of a Daily Newspaper, with the prominent features of complete and exclusive intelligence on every subject connected with the Shipping and Trade of the United Kingdom The Shipping Gazette has obtained a character for correctness and usefulness unprecedented in the annals of Newspapers. It now commands an extensive circulation throughout the United Kingdom and the Colonies, on the Continent of Europe, in the United States of America, and other foreign countries; and is therefore a most eligible medium for commercial and miscellaneous advertisements, particularly those that relate to the sale, charter, freight, equipment, and sailing of vessels, and the sale of merchandise, and that have for their object the particular attention of Merchants, Ship-Owners, and Mariners, and those having dealings with them The establishment of the Shipping Gazette forms a new era in the history of Shipping Intelligence; comprising, as it does, daily and complete announcements of the arrival and sailing of all vessels, in the coasting and foreign trades, together with an accurate account of vessels spoken at sea; state of winds and weather; accidents; losses; rates of foreign and coasting freights; premiums of insurance; wholesale prices of goods; stock-exchange news; coal, corn, and other markets; which information is regularly furnished and derived from the most authentic sources at home and in foreign countries trading with Great Britain. The Shipping Gazette further embraces a comprehensive detail of domestic and miscellaneous intelligence; records of all important events; reports of parliamentary proceedings, public meetings, decisions of law and police courts, &c., especially such as refer to nautical and commercial matters; and altogether contains a larger mass of information than is afforded by any other Evening Newspaper. The Shipping Gazette is frequently referred to by witnesses examined before Committees of the House of Commons, as furnishing the most authentic evidence on maritime affairs. Orders, communications, and advertisements for the Shipping and Mercantile Gazette, are received by its Agents at the respective out-ports, and by any News Agent in town or country. Advertisements and communications to the Editor, may be sent to the Publication Office, No. 54, Gracechurch Street, London.

LAW OF PATENTS.

ALL WORKS PUBLISHED on the PATENT LAWS of Great Britain and Foreign Countries, and all the PERIODICALS relating to INVENTIONS, MANUFACTURES, RAILWAYS, STEAM NAVIGATION, SCIENCE, and the ARTS, are to be had at

THE PATENT OFFICE, 198, STRAND.

AMONG OTHERS, THE FOLLOWING WILL BE FOUND OF PERMANENT INTEREST:—

WORKS ON THE PATENT LAWS.

CARPMAEL (W.), on the Law of Patents for Inventions, familiarly explained for the use of Inventors and Patentees.

DAVIES' (John) Collection of the most important Cases respecting Patents of Invention, and the Rights of Patentees, which have been determined in the Courts of Law since the Statute for Restraining Monopolies; to which are added some Practical Observations resulting from the decision on the several cases.

DREWRY'S (Charles Stewart) Patent Law Amendment Act; with Notes and Cases, and an Appendix of Rules and Forms.

GODSON'S (Richard) Practical Treatise on the Law of Patents for Inventions, and of Copyright: Illustrated by Notes of the Principal Cases, with an Abstract of the Laws in Force in Foreign Countries.

HAND'S (William) Law and Practice of Patents for Inventions.

HOLROYD'S (Edward) Practical Treatise on the Law of Patents for Inventions.

RANKIN'S Analysis of the Law of Patents.

SMITH'S (John William) Epitome of the Law relating to Patents for Inventions, as altered by Statute, 5 and 6 W. IV., c. 83; with an Appendix of Statutes and Forms.

SCIENTIFIC PERIODICALS.

Art-Union.
Athenæum.
Chemist.
Civil Engineer and Architects' Journal.
Literary Gazette.
London Journal of Arts.
Magazine of Science.
Mechanics' Magazine.
Mining Journal.

PERPIGNA'S (Antoine) Manuel des Inventions et des Brevetés,—French Edition, on the Law of Patents in France.
Ditto, ditto, Translated into English.
Philosophical Magazine.
Polytechnic Journal.
Railway Magazine,
Railway Times.
Repertory of Arts.
Transactions of the Society of Arts.

VARLET'S (M.) Recueil des Loi et Réglements, en Vigeur en Belgique, sur les Brevets d'Invention,—French Edition on the Law of Patents in Belgium and other States.

ACTS OF PARLIAMENT.

PATTERNS,—
27 Geo. III., c. 38; 29 Geo. III., c. 19; 34 Geo. III., c. 23; 2 Victoria, c. 13; 2 Victoria, c. 17. (The last relates to patterns and *models*.)

PATENTS FOR INVENTIONS,—
21 James I., c. 3; 5 and 6 Will. IV., c. 83; 2 and 3 Victoria, c. 67.

SCULPTURES,—
38 Geo. III., c. 71; 54 Geo. III., c. 56.

ENGRAVINGS,—
8 Geo. II., c. 13; 7 Geo. III., c. 38; 17 Geo. III., c. 57; 6 and 7 Will. IV., c. 59.

COPYRIGHT,—
8 Anne, c. 19; 12 Geo. II. (Booksellers' Act), c. 36; 15 Geo. III. (Universities' Act), c. 53; 54 Geo. III. (General Copyright), c. 156; 1 and 2 Victoria (International Act) c. 59.,

TO INVENTORS & SCIENTIFIC MEN.

THE INVENTORS' ADVOCATE, AND JOURNAL OF INDUSTRY;

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Mining Journal Office, 37, New Broad-street, City, 27th June, 1840.

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The Number of the Mining Review this day published, contains the Sixth Part of the Paper on the Iron Trade, by Harry Scrivenor, Esq.—this work will be completed in Twelve Monthly Parts, and so arranged as to form a separate volume at the end of the year; in addition to which the Mining Review contains—A Paper on the Establishment of a School of Mines—On the Ventilation of Mines, by Samuel Moyle, Esq., C.E.—On the Preparation of China-Clay, by W. J. Henwood, Esq., F.R.S., &c.—On Blasting Limestone Rock, being an Account of Blasting the White Limestone in the Country of Antrim, Ireland, by William Bald, F.R.S.E., M.R.I.A.—On the Applicability of Peat to Manufacturing Iron—Parliamentary Returns of the Imports and Exports of Copper, Lead, and Tin, for the year ending 5th January, 1840—Scientific Bodies, &c.—The Mining Review is published at the office, as above, on the 1st of each month, price Sixpence.

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THE

INVENTORS' ADVOCATE,

AND JOURNAL OF INDUSTRY;

A WEEKLY BRITISH AND FOREIGN MISCELLANY OF

SCIENCE, INVENTIONS, MANUFACTURES, & ARTS.

No. 65.] SATURDAY, OCTOBER 24, 1840. [PRICE FIVEPENCE STAMPED. CIRCULATING FREE BY POST.

THE THEORIES OF WINDS AND STORMS.

One of the most interesting papers read at the late meeting of the British Association for the Advancement of Science, was that of Mr. Espy, on his theory of storms. It was the result of much observation, and his theory seems to have been founded on data, which, from their appearance of accuracy and research, give additional weight to the conclusions at which he arrives. His paper produced much discussion, owing to the new views he takes of the causes of storms, and the facts with which he endeavors to establish his opinions. The theory, therefore, well deserves to be considered, in order to confirm or disprove it.

In an article on the Causes of Winds, inserted in a former number of our Journal,* we stated that, in our opinion, the contraction of the air by the deprivation of heat in the night time, rather than the expansion of the air by heat during the day, was the cause of the regular currents of air following the track of the sun, called the trade winds. We are aware that this opinion differs from that generally entertained, for it is usually supposed that the air heated by the direct rays of the sun becomes specifically lighter than the superincumbent strata of air, and consequently rises in the atmosphere, whilst colder and denser air from the north and south rushes in to supply the partial vacuum caused by the ascending air. It is upon this supposition of heated air rising, and of its place being supplied by colder air, either from the upper regions of the atmosphere, or from colder strata near the surface, that Mr. Espy's theory depends. If, therefore, we can show that he is mistaken in this opinion,—if it can be proved that the stratum of air near the surface of the earth when heated by the sun does not become lighter than the air above it; that it merely *expands, but does not rise*, or change its relative position, then the ground on which Mr. Espy's theory is built will be removed, and his facts will require a different explanation from that which he has afforded.

The general opinion that air heated by the sun rises from the ground, is derived from the observation of several facts and experiments which prove that air when heated, under certain circumstances, expands, becomes specifically lighter, and rises in the atmosphere. But the circumstances in the one case are essentially different from the other, and we cannot be too cautious in drawing conclusions respecting the operations of nature from the results of the limited experiments which alone man is enabled to make. We shall, in the first place, for the purpose of pointing out the fallacy of the general notion respecting the cause of winds, show that air heated by the sun does not become lighter than the air above it; and then explain the causes of difference in the effects between solar heat, acting on the whole mass of air, and artificial heat, applied only to a small quantity.

It must be borne in mind, that the only reason why air becomes lighter by being heated, is, that it is thereby expanded; consequently a smaller weight of air is contained in the same volume. If the effect of expansion be produced by any other means, the specific gravity is reduced quite as effectually. It therefore follows, as a natural consequence, that unless any given volume of air be expanded by heat more than the expansion consequent on diminished pressure in the upper strata of the atmosphere, it will not have a tendency to rise.

All we have to do, then, to ascertain whether the expanding effect of the heat of the sun on the air is equal to that of the diminished pressure of the atmosphere, is, to determine the ratio of expansion owing to diminished pressure at different elevations—the ratio of diminution in temperature as we ascend—and also the amount of expansion produced by any given increase of temperature. For instance, if we find that the diminished pressure as we ascend in the atmosphere gives greater expansion to the air than the increase of temperature gives to the air beneath, we may conclude that the heavier air below will not rise from its position to occupy the place of the lighter air above.

We can determine this fact in the following manner. In the first place, the ratio of diminution of the atmospheric pressure at different elevations has been ascertained by the barometer with great accuracy. It is found, that at a height of 349 feet from the level of the sea, the mercury in the barometer will fall from 30 inches to 29 6-10ths. At a height of 883 feet the mercury will fall to 29 inches, or one-thirtieth of the whole pressure of the atmosphere. At that height, therefore, the specific gravity of the air is diminished one-thirtieth part.

Secondly:—The expansion of air by heat is ascertained by experiment to increase in arithmetical progression. A quantity of air consisting of 480 volumes, at the freezing point expands one volume for every additional degree of heat of Fahrenheit's thermometer. At a temperature of 48 degrees,—that is 16 degrees above the freezing point—480 volumes of air are expanded to 496 volumes, or one-thirtieth of the whole. We, therefore, perceive, that an increase of 16 degrees of heat occasions the air to expand to the same extent as an elevation into the atmosphere of 833 feet. It is therefore apparent, that if the difference between the temperature of the air at a height of 833 feet, and on the ground, is not greater than 16 degrees, the air near the ground will not have a tendency to rise to occupy the place of air, at least equally expanded, and therefore rendered equally light from a different cause. But the actual difference in the temperature is not one fifth part that amount. It has been found, by experiment, that the thermometer falls about one degree for every 300 feet of elevation, consequently there would not be three degrees of heat difference between the upper and the lower strata of air at the height we have assumed. The expansion produced by an increase of temperature of three degrees would be only 160th part of the whole mass; whilst the expansion occasioned by diminished pressure at an elevation which would produce that difference in temperature, amounts to 1-30th of the whole. The effect of heat, therefore, in diminishing the weight of the air, when compared with the effect of diminished pressure, would not be as one to five.

In those cases of common occurrence, wherein a portion of air heated by artificial means rises in the atmosphere, the circumstances are the opposite of those occurring where a large volume of air is heated by the sun. The heat employed is much greater than that of the sun's rays, and the volume of air acted on is so small that its expansion by heat exceeds that arising from diminished pressure. Air heated by the fire, for instance, is expanded two-thirds of its original volume, instead of only 1-160th part, whilst the quantity acted on is so small that there is no perceptible difference in the atmospheric pressure between the heated portion and that immediately above it. Such air would, therefore, be three times as light as the superincumbent atmosphere, and would consequently rise.

* Inventors' Advocate, No. 61.

We thus perceive that there is no analogy between the two cases, and that it is quite erroneous to assume, that because air heated by the fire rises up the chimneys, or because a fire balloon rises in the atmosphere, that therefore air heated by the sun must also ascend. As Mr. Espy's theory of storms depends on the effects of the supposed rising currents of heated air, it will be seen that if our view of the matter be correct, his theory must be altogether abandoned, and with it the ordinary notion of the cause of winds. We shall, in a future number, follow up the subject, for the purpose of showing what we conceive to be the effects of the sun's general action on the atmosphere, and the causes that influence those sudden and violent commotions which are experienced during storms and tornadoes.

BRITISH INDIA AND MANCHESTER.

(From the *Manchester Times*, of Saturday last.)

A deputation from the British India Sugar Company has visited Manchester, and is now, we believe, in Liverpool, endeavoring to interest the friends of free labor and free trade in favor of their project for growing and manufacturing sugar upon a large scale in India. Many of the Society of Friends and other ardent abolitionists take up their object with spirit, as the best practical means of defeating by competition slave labor and slave products; but we think there are other reasons why Manchester especially should feel interested in their success. It is clear that British India might be the best market for manufactured cottons in the world, and nothing has, till lately, so much prevented it as the monopoly of the East India Company, and the absurd and prohibitory discriminating duties on East India products. Now, however, that the East India Company is prevented by act of Parliament from engaging in trade, and the duties on East India and West India sugars are equalised, those obstructions no longer exist; on the contrary the East India Company have stated through their secretary, Mr. Melvill, that they shall give every encouragement in their power to the investment of British capital in the products of British India. With these altered and cheering circumstances, in addition to the main fact that the labor of the Hill Coolies can be had for 2d. per day, while that of the negroes in the West Indies fluctuates from 2s. to 4s. sterling, there cannot be the least doubt of the practicable and profitable character of the British India Sugar Company. There is no occasion, however, to theorize on the subject,—the fact is proved. During the last few years a quiet, snug little company, called the *Dhobah Sugar Company*, have been growing and manufacturing sugar in India (which sugar is esteemed by the trade as among the best in the market), and it is said that this company is now realising no less than 150 per cent. per annum upon their capital. Mr. Larpent, in his evidence before the House of Commons, says —"The consumption of British manufactures in India is believed to be limited only by the power of purchase. They are spreading all over the country, *particularly the goods of Manchester and Glasgow*, and have supplanted the use of native manufactures." Mr. Trevelyan also, in his evidence before the House of Commons, says—"Within a few years native manufactures have been extensively displaced in India by those of Great Britain A taste for British manufactures, and even British luxuries, is springing up, and has extended far into the interior. *The cotton goods of our country are in general use.* They are found at places many hundred miles from the nearest English merchant; at the town of Parlee, in the centre of Rajpootana, *great quantities of Manchester goods* are stored and sent forward." What the consumption of Manchester goods might be by the 120,000,000 of our Indian subjects, may be better conceived than described. Mr. Syms, another enlightened writer, and a great grower of sugar, says—"The limit of the consumption of British manufactures by India could be only its power of paying for them by the produce of the soil. At present, however, the consumption is only at the rate of about 6d. per head; in British North America it is 3*l.* a head; in the West Indies 4*l.* 10s. per head; in Australia, 8*l.* per head.

WOOLLEN MANUFACTURES OF SPAIN.

So little is known of Spain in respect of its various branches of industry and manufactures that some details of the extent of its woollen manufactures may not be without interest. This species of manufacture is one of the most ancient in the country, and the most generally and successfully cultivated in Spain. The manufacture may be found in nearly all the provinces, and it is the almost exclusive occupation in a great number of towns. The chief central points of this trade in Valencia are, Alcoy, Onteniente, Morella, Villa Real. For New Castile—Toledo, Brihuega, Guadalajara. For Old Castile—Valladolid, Avila, Segovia, and Santo Domingo de la Calzada. For Estremadura — Alcantara. In Leon—Bejar. In Arragon—Tarazona, Saragossa, Huesca, and Jaca. In Catalonia—Vich, Tarrassa, Igualada, Falset, Reuss, Olot, and Barcelona. Spanish woollen cloths wear generally extremely well. In Valencia, notwithstanding the civil war, the manufacture has increased considerably. In 1839, Alcoy, the population of which has nearly doubled since 1820, and now amounts to 20,000 souls, manufactured alone 24,000 pieces of 32 varas each (the Spanish vara being equal to the yard within about an inch or so), or 768,000 varas, which, at 8s. 3d. the vara, represent a capital of upwards of £300,000. Onteniente, with a population of 12,000, contains about 40 manufactories. Besides the common woollens, cloths of a middling quality are made in these places, not very inviting in appearance, as wanting in finish, but the substance and low price of which ensure a preference for general consumption over foreign woollen cloths. The same remarks will apply equally to the Catalonian woollens. The finest qualities of cloth are made in Old Castile, at Segovia and Avila. These, with the lower quality cloths of the two Castiles, of Leon and Estremadura, well suited to the taste and wants of the country, find a profitable vent out of the provinces where manufactured. The heaviest descriptions, such as those of Arragon, are only suited for local consumption. Madrid, Barcelona, Seville, and Cadiz are the only places where foreign woollen cloths find a sale, but only as a sort of luxury for the more wealthy classes. English woollens, from the brilliancy of their finish and the moderation of their price, enjoy a great preference, especially in Andalusia. Some importations of French woollen cloths take place for Madrid and Barcelona, but not of much importance, although the quality is esteemed of a superior kind. Spanish woollens are made exclusively with wool native grown. Foreign wools are strictly prohibited. The supply of the home market is besides well secured to the manufacturers of the country by the absolute prohibition with which the impost tariff visits all foreign cloths of less value than 90 reals (about 18s.) the vara, by the enormous duty of 26 reals de vellon, or about 5s. 3d. the vara, imposed upon all qualities above that price. To this duty, falsely called *only* duty, must be added that of 15 reals 20 maravedis per vara, which, under the name of duty *de portes*, has to be paid on entry into all the important places and chief provincial cities. It is only the finest foreign qualities which can support such excessive imposts, of which the whole amounts to 41 reals 20 maravedis per vara.

RAILWAY LAWS AND RAILWAY MANAGEMENT.

(From the "*Morning Herald.*")

The frightful havoc of life and limb which has occurred upon railways, and of which the destructive collision on the Southampton Railway, on Saturday evening, affords a new instance, either proves "railway science" to be a most clumsy sort of ignorance, or is the consequence of gross and criminal negligence.

An opinion is gaining ground, from the frequency of railway accidents, that the legislature abandoned its duty when it concurred, either advisedly or unconsciously, in the grant of such extensive powers, without adequate check, as those now enjoyed by railway monopolies; for monopolies they are, and perhaps must virtually so remain from the very nature of the undertakings. It has been suggested, however, that much might be done towards the exaction of a real responsibility from those concerned in the administration and superintendence of railways, if the existing law of the land in regard to homicide by gross want of care or mismanagement were put in force by coroners' juries, and culpable parties directly implicated, or in any way involved, in whatever capacity, were sent to take their trial for manslaughter; and in other cases, where the proof of negligence was not so gross as to amount to that degree of criminality, if such *deodands* were imposed as would operate as a wholesome check upon the cupidity or indiscretion to which life is sacrificed, or by which endangered. In the one case punishment might reach even to directors, against whom negligence in the selection of experienced officers or inferior servants might be brought home; in the other the punishment by *deodand* would fall upon the company in its conjoint capacity, on which a fine so levied would weigh too lightly perhaps, if left to the construction of common juries, to be productive of the desired effect. Now considering that the legislature has been principally to blame in failing to make better provision against railway abuses, and for the security of life, and by the omission has seemed to abdicate all right of interference; making allowance moreover for the limited and imperfect range of railway science and experience, we are disinclined to deal too harshly with directors thus launched upon an unknown sea, much less through the will or faults of their own than the criminal neglect or sufferance of the legislature. But therefore it becomes only the more imperative upon the power which has created or tolerated the existence of a public wrong to apply a remedy and correct its own blunder.

In the case of this deplorable calamity on the South Western Railway, there certainly appears an extraordinary and most unpardonable want of the most common precaution. We may go further, for it would seem that an extreme and scandalous laxity of system pervades the administration, as the trains are rarely punctual to time, and this can only be owing, either to the employment of unskilled mechanics in the working of the engine, or to a deficiency of locomotive power equal to the traction of the load to be drawn along In either or in both cases, it may be assumed almost with certainty, that the breach of engagement with the public in respect of time, and the disasters resulting from the want of punctuality, and consequent derangement of the rules of railway economy, as on the present occasion, are mainly attributable to false and close-spun notions of niggardly saving. That is, the lives of passengers are inconsiderately or ruthlessly endangered for the sake of economising fuel to the extent of one or two horse power per journey, so as to screw up a fund for the payment either of directors' salaries, or dividends, or both

It is clear that railway management must form a subject for inquiry in the next session of Parliament. For the satisfaction no less than for the safety of the public this is both desirable and indispensable. We do not think that opposition to it on the part of railway companies would be politic, and we feel assured after all, and gratified in believing, that there are railway concerns so skilfully conducted as not to be damaged by, and which therefore need not shrink from the test of any parliamentary inquisition.

CONDITION OF AUSTRALIAN EMIGRANTS.

The following letter from South Australia, dated Adelaide, March 12, 1840, is taken from the *Times*.

"It is very distressing to look around me and

see so many (once respectable and wealthy) young men, with hardly a coat to put on, driving bullocks, attending masons, &c. They left their homes young, bringing with them all they had in the world—some lost one way, and some another.

"The assizes are just over this week. Six men are sentenced to death—three for bushranging, three for highway robbery; and a great many transported for life. The assizes are held every three months; and there were upwards of fifty tried this time. Our force (the police) is upwards of 100 strong. We are on the look-out for upwards of 20 bushrangers, who are coming overland from Port Philip.

"I am sorry to say the botanist has given up all hopes of this colony. He says it is quite impossible to bring any European plant to perfection here. The potatoes are very bad. Corn, wheat, and barley will perhaps do very well for the first one or two months; then the north winds, dust, and insects make them just like snuff. I would advise no man to come here with a family. There is plenty of money to be made, but every man is for himself, snapping who shall have the most, to get from this place as soon as possible. The most profitable business is keeping a boarding-house. 10*l.* at home will go as far as 50*l.* here.

"This is a strange town; just a wood, with a small house here and there in it. We have all sorts of people, from the Irishman to the African. We have also plenty of fleas, bugs, and mosquitoes. I suppose you are getting very favorable reports of this colony from some of the old inhabitants, who wish to invite some of their friends to come to this 'fairy isle,' where in the summer time you can scarcely get a drink of good water, with a burning sun all day long, the north wind as hot as fire, blowing the sands in clouds, enough to stifle you, and burn the eyes out of your head. Then, again, in the mornings and evenings you are very glad to get a fire. Now, when these pretended friends get a number of their old neighbors to come here and bring money with them, they are all in all so long as the money lasts, advising them to buy land, sheep, &c., from them, which they can get no other person to do. This is the way, or rather this is the reason, why so many young men are here, I may say destitute of a home.

"A man that wishes to make money in this colony must come here depending on himself. He must make up his mind to all work and no play.

"We have some very fine birds here. In two or three hours I can get as many as will make a good dinner for four or five. The kangaroos are very scarce now in the immediate neighborhood of Adelaide. The poor blacks say, 'Kangaroo no like white man.' These people are a very dirty race. They will not work until they are actually starving. There is not one of them that can be brought to any kind of civilisation."

ENGLISH EXPIRED PATENTS.

William Mills, of Hazelhouse, Bisley, Gloucestershire, *for an improvement in fire-arms*, Oct. 18.

William Church, of Birmingham, *improvements in printing*, Oct. 18.

Samuel Pratt, of New Bond-street, *improvements in beds, bedsteads, and other articles of furniture*, Oct. 18.

William Busk, Broad-street, London, *improvements in propelling boats, ships, or other vessels*, Oct. 18.

James Viney, of Shanklin, Isle of Wight, and George Pocock, of Bristol, *improvements in the construction of cars or other carriages, and the application of a power hitherto unused, to draw the same, and other purposes*, Oct. 18.

SPECIFICATIONS.

ENTERED AT THE ENROLLMENT OFFICE.

(*Continued from page* 244.)

William Grimman, of 7, Camden-street, Islington, *new mode of wood paving*, Oct. 12.—Claim first.—The application of blocks, whose vertical ends form a regular figure, and to which, by the application of an outer angle of one block to the inner angle of another, and by continuity they form a solid mass by each block pressing on or being pressed upon by the adjoining one, be their angles more or less than 77 deg.

The inventor uses blocks, whose faces being cut vertically form a regular figure, say a parallelogram; their longest sides are twice their breadth, and their depth equal to the longest side of the face, and they are laid down in the following manner. On the first block, call it No. 1 being laid down, No. 2 is placed with its inner end against the upper part of the outer side of No. 1; No, 3. is then placed with its inner side against the outer side of No. 1, and its inner end against the lower part of the outer side of No. 2; No. 4 is then placed with the upper part of its inner side against the outer end of No. 1, and its inner end against the lower part of the inner side of No. 3; No. 5 is then placed with its inner end against the lower part of the inner side of No. 1, and the upper part of its outer side against the lower part of the inner side of No. 4; No. 6 follows with its inner end against the upper part of the inner side of No. 5, and its inner side against the upper part of the inner side of No. 1; then No. 7 is placed with its inner end against the upper part of the inner side of No. 6, and its inner side against the upper end of No. 1, which will then be completely surrounded, and the process is then proceeded with until each block is surrounded in the same manner; and on approaching the extremity of the work the blocks must be cut horizontally, on the side nearest the extremity. when they will fit in and the whole form one solid mass.

Claim second —The mode of cutting and laying the blocks on a level bed covered with thin pieces or slips of wood.

The inventor recommends this arrangement of blocks to be laid on a bed of asphalte or other level surface, on which it would be better to place very thin slips of wood previous to laying down the blocks.

Thomas Young, of Queen-street, City, *improvements in lamps*, Oct. 13 —Claim first.—Mode of regulating the flow of oil in fountain lamps, by means of floats and cocks.

This is effected by an apparatus of the following description. The oil is contained in a bag of leather or other flexible material, placed in the bottom part or standard of the lamp, from which it rises through a curved pipe into the pillar of the lamp; to this curved pipe is adapted a cock, which is acted on by a float placed at the top of the pillar and floating on the oil by means of a float rod which connects the two by passing down the pillar, so that when a sufficient supply of oil has been given to the wick the float rises and stops the flow until that which has risen is consumed; when more oil is allowed to enter the pillar, by the gradual sinking of the float, and the consequent opening of the cock in the curved pipe; there is also an extra tube so adapted to the upper part of the pillar near the wick, as to catch any oil that may run over, and thereby prevent it from running into the air passage, so that the wick may be said to be in the midst of oil, there being as much on the inside as on the outside of it.

Claim second.—Mode of applying bags for the purpose of containing oil in fountain lamps.

These bags are composed of leather or other flexible material, with a covering of linen, and are surrounded by circular weights or rings, which answer the double purpose of keeping the bags in shape, and also of pressing on them to cause the flow of oil.

Claim third —The application of perforated plates to the flames of lamps.

These plates are of metal, and are perforated, having a large hole in the centre, which is surrounded by a number of smaller holes, and are placed at a short distance from the point of ignition, thereby greatly improving the combustion: they may be retained in their proper place, either by the chimney of the lamp, or by having standards affixed for the purpose, which can be made to slide, so as to raise or depress the plate as may be found necessary.

Claim fourth.—The application of a spiral wire to the flames of lamps.

This is simply a wire, similar to a spiral spring, and is placed close to the flame of the lamp, and is about one inch in length; by using this the light will be greatly improved, as it causes a more regular supply of atmospheric air to the flame.

Edward Thomas Bainbridge, of York-place, St. James's, *improvements in obtaining power*, Oct. 13.—These improvements consist in combining gravitation with the pressure of the atmosphere to produce accelerated motion.

Claim first.—The method of obtaining power by taking advantage of the force of accelerated motion caused by gravitation, in connection with a rush of atmospheric air to a vacuum.

A trumpet-mouthed cylinder is provided and placed in a vertical position, and is furnished with a piston and piston rod, made strong and of sufficient weight to overcome friction when the cylinder is in the above-named position; down one side of the piston rod are holes or notches similar to a rack, the top end passes freely, but nearly air tight, through a fixed circular block, and on the top end of the piston rod is fixed an inverted cylinder; a cranked lever is attached to the axle, the short end of which is forked, and embraces the circular block, to which it is fixed by links and pin joints; to the other end of this lever is fitted a driver, which takes into a racket wheel fixed on the main shaft; to the piston rod is adapted a wheel with projecting teeth or studs on part of its edges, so that on the revolution of this wheel the teeth or studs take into the holes in the piston rod, and thereby raise it, which it continues to do until the last stud or tooth has taken into the piston rod, which will then be at its full height, and a vacuum formed in the cylinder underneath, when the plain part of the wheel coming against the piston rod it will descend by its own gravity, and on its nearly reaching the bottom the inverted cylinder at the top will cover the circular block which fits it as its piston, and thereby modify the shock, so that the force is taken from the piston before it reaches the end of its stroke, and communicated to machinery, by which means power is obtained. A fly wheel is fixed on the main axle to regulate the movement, which is thus communicated by a succession of shocks or percussions.

Claim second.—The use of an elastic body to aid the return of a piston, upon which the rush of atmospheric air has exerted its power when rushing to a vacuum.

William Unsworth, of Derby, silk lace manufacturer, *improved tag for laces*, Oct. 14.—These improvements consist in forming tags for laces, so that the tag is prevented from coming off the lace, and also the user is enabled to supply a new tag at pleasure. This is effected by simply placing the tag on a wooden mandril, and with a punch (one with a triangular point is recommended) pressing on the outside of the tag, so as to form a burr, tongue, projection, or catch on the inside, which answers the purpose required, and which is the part claimed by the inventor, and may be performed either before or after the tag is inserted.

John Gold, Etna glass-works, Birmingham, *improvements in the manufacture of decanters, and other articles of glass*, Oct. 15.—Claim first.—Mode of forming the lower part of bottle-shaped vessels, by means of an inner die and mould, as hereafter described.

For this purpose an apparatus of the following construction is employed:—A mould of the ordinary description is placed, into which the melted glass is poured instead of blown as formerly; an inner die is provided with a smooth or even outer surface, in the centre of this die there is a rod with an air-way passing down it, and at its top end a regulating screw acted on by a winch. This inner

die is inserted in the mould after the glass is placed there, and pressed upon by a ram, thereby imparting a smooth or even inner surface to the vessel, instead of concavities, answering to the projecting figures, or pattern on the outside as heretofore. On the ram being removed, and air admitted by the air-way, the inner die may be withdrawn, and the neck formed in the usual manner.

Claim second.—New mode of forming plates for doors and other purposes. This is by casting them in a mould, having the pattern cut or engraved on the bottom, and forming a smooth surface on the top; the design or pattern is gilded or painted underneath, and showing through to the outer surface, which is left quite smooth and plain.

Claim third.—For drops of a peculiar form, for chandeliers. These are made with acute angles, and are cast in a mould in the usual manner, and by this arrangement much greater brilliancy of effect is obtained.

The inventor wishes it to be understood, that he does not claim the above described apparatus for forming a smooth surface to vessels generally, but only to such vessels as are to be finished with stoppers.

JAMES CALDWELL, Mill-place, Commercial Road, engineer, *improvements in cranes, windlasses, and capstans*, Oct. 15.—Claim first.—New mode of constructing cranes, as hereafter described.

Claim second.—Mode of applying inclined surfaces, to cause the fleeting, or clearing of the rope or chain.

To the upright which carries the crane is fixed a beam horizontally, at the end of which is a platform. An upright post is properly stepped into this beam about the centre, and the top end is fastened to an inclined stay which reaches to and supports the gib; a diagonal stay is let into the beam in such a position as to support the upright post, whereby the whole is greatly strengthened, and in working a crane of this description the rope takes only two or three turns round the barrel, and the slack is taken up by a weight situated over the platform. The inclined surfaces to be used for these cranes are the same as those adapted to windlasses, explained hereafter.

Claim third.—Mode of constructing cranes for the purpose of unloading barges, and such like craft.

These cranes are made to fit into the barge, and are furnished with two gibs; one called a working, the other a counterbalance gib, and are tied together by iron rods or bars. The working gib is made of two plates, and has a runner between capable of being passed from end to end, and provided with a pulley and rollers, or friction wheels. Over the pulley the lifting rope or chain is passed and attached to the weight to be raised from the vessel, which may be done by a man giving motion to a barrel round which the rope turns, and the weight thereby raised to the lower part of the working gib, when by causing a second barrel to revolve the runner with the weight just raised is moved to the upper part of the working gib or to any point between; the movements in both cases being assisted by weights at the top of the counterbalance gib which take up the slack rope. This kind of crane is best adapted for unloading barges, &c. that are loaded with boxes or packages of the same size.

Claim fourth.—Mode of applying an instrument with cranked levers to windlasses.

This is a short cranked lever fitted to the uprights of windlasses, into one end of which a handspike is inserted, and on the same being pressed down the other end of the lever causes an instrument of a novel construction to move and take into a racket wheel for the purpose of keeping the barrel from turning back. The instrument alluded to is constructed of two plates of iron fastened together by a pin near the centre and a bolt through the end which takes into the teeth of the racket wheel, fixed on the barrel for the purpose of keeping it from running round after having been turned by the handspikes.

Claim fifth.—Mode of applying inclined surfaces to windlasses for the purpose of causing the fleeting or clearing of the rope or chain.

Claim sixth.—Mode of applying inclined surfaces to capstans, for the same purpose.

These plates, which the inventor calls fleeting plates, are applied underneath the barrels of windlasses, for the purpose of guiding the rope or cable towards the centre of the barrel, which is constructed so as to incline from both ends towards the centre, which has a groove run in it; and by this arrangement a few turns of the rope will answer the required purpose, while the slack may be disposed of in any convenient manner.

WILLIAM POTTS, of Birmingham, brass-founder, *invention of an apparatus for suspending pictures and curtains*, Oct. 15.—Two rods which are tubes, and offer simple vertical surfaces in which there are holes or apertures, capable of receiving and retaining studs at various points. To these openings or apertures are adapted pulleys and frames with enlarged heads or studs at the back, for the top of the picture to be hung. For the bottom of the picture short buttons or hooks, furnished with a similar head or stud at the back. At the back of the upper part of the picture is a rod with openings in it at various parts, so that the hooks or studs being placed at a convenient height in the holes, in the vertical surfaces there are rings on the back of the bottom part of the picture which take on to these studs. A cord is passed through the pulleys; to each end are fixed studs, which are made to take into any two holes in the rod at the back of the upper part of the picture, according to the required slanting position of the picture.

It will be evident that for the above arrangement of pictures, a person would require the assistance of steps to reach the top of the picture, in order to adjust the cord in the openings. This may be obviated by having an additional pulley with a longer cord fixed to the picture, and which is made to wind round a small cylinder placed near the bottom, by means of a small winch and handle. Instead of simple hollow rods, for the purpose of supporting and retaining the studs, chains or ornamental mouldings of either a plain or elegant pattern may be used, so long as attention is paid to preserve regular vertical graduated surfaces.

For curtains, nearly a similar arrangement is employed, with the addition of runners, in connection with small rollers, by which means the hooks on which the curtains are hung are easily shifted. This part of these improvements applies equally to bed-hangings as to other curtains, and supersedes the use of the ordinary curtain rod and rings.

SAMUEL WILKES, of Darleston, Stafford, iron-founder, *improvements in the manufacture of vices*, Oct. 12.—Claim first.—Mode of casting vices of malleable iron; and afterwards annealing the same.

Claim second.—Mode of constructing a hollow screw for vices.

Claim third.—Mode of constructing moveable dovetailed steel chaps to vices.

Claim fourth.—Application of dovetail guides for guiding the chaps of parallel vices.

Claim fifth.—Application of cylindrical tubes to the screws of parallel vices.

The inventor, after observing that by vices being made of wrought iron entirely, and consequently by superior workmen only, their cost is much increased, proceeds to describe the nature of his improvements, which consist in first having brass models made, with which sand moulds are constructed in the usual manner, and the melted malleable iron poured therein to produce the required shape and size. They are then to be annealed, for which purpose they are placed in a suitable oven, and surrounded with rich iron ore, finely powdered, and heated at first to a red heat, which is gradually increased, until the process is complete; which will depend upon the size and thickness of the article under operation. If it be half an inch thick, four days will be required. For the better annealing of the screw it is preferable to have it cast hollow, which may be done by introducing a sand core in the mould, in the manner well known. By this process the quality of the metal will be greatly improved. These vices are cast with a hollow dovetail in each chap; when a solid one to correspond is made on steel chaps, and by this means they allow of being easily driven out, and replaced by new ones, as occasion may require. In the construction of parallel vices, in which the hinder chap is the moveable one, a dovetail piece is attached to the bar on which the chap slides, to guide it evenly, after the manner of the sliding parts in turning and other lathes. To the screw of these vices is also adapted a cylindrical tube which contains the nut, and imparts steadiness to the sliding chap.

SAMUEL MARLOW BANKS, Bilston, Staffordshire, gent., *improvements in the manufacture of iron*, Oct. 14.—Claim.—Mode of conveying solid particles into the furnace with the blast, be it either hot or cold.

The apparatus described for these improvements consist of a blast pipe, which has a flange near the leather bag; to this flange is fitted a stop-cock, over which there is a hopper with a screwed lid or door; in the side of the hopper near the top is an aperture through which there is a communication by means of a small pipe with the blast pipe. Into the hopper is placed powdered slack, coal, coke, anthracite, charcoal, limestone, iron ore, or any other requisite material broken small, and on the stop-cock being opened these fall into the pipe beneath and are carried by the blast into the furnace; the communicating pipe is for admitting the blast into the upper part of the hopper, so as to give to the particles contained therein their proper gravity. The door or lid of the hopper may then be unscrewed, and a fresh supply added, when the same process is repeated. The inventor does not confine himself to the above described apparatus, but claims any arrangements whereby solid particles are carried into the furnace with or by the blast.

ROBERT COOPER, Pebworth, near Evesham, Gloucester, gent., *improvements in ploughs*, Oct. 16.—These ploughs are for forming trenches for the purpose of draining land, and by their construction may easily be removed from place to place. The wheels which carry the plough are placed on a cranked axle, which may be regulated by a screw and screw-wheel, so as to accommodate it to uneven ground or the side of a hill. Just before the shares are two revolving coulters, which cut into and divide the surface of the ground. The distance of these from each other is regulated by a screw passing through both; the depth of their cut may be also regulated by a simple apparatus of socket and pins. Just behind these are placed the coulters for forming the sides of the trench, behind which, and in the same inclination, are land plates for the purpose of preserving the side of the trench so formed. A flat share with a cutting edge performs the horizontal cut, and the mould as it is cut from the trench ascends an inclined plane, and is deposited in an undivided stream along the side of the trench on the right hand of the person driving the plough.

ENTERED AT THE ROLLS CHAPEL OFFICE.

(Continued from page 230.)

SAMUEL HOWARD, Manchester, Lancaster, engineer, *improvements in boilers and furnaces*, Oct. 8.—These improvements consist first, in a peculiar construction of boilers whereby a considerable increase of heated surface is obtained;—secondly, a new mode of feeding a boiler when required; and these improvements are applicable to the boilers of marine, stationary, and auxiliary engines.—For marine engines the boiler should be divided into three compartments, and over the centre one a chamber is placed which receives the steam generated in it, and also that which is generated in the other two compartments, with which it communicates by means of pipes fitted for that purpose.—A series of water chambers are so formed and arranged in the boiler with regard to the flues, that the heat is made to pass through the entire series in the form of a grooved passage or way, taking a slight rise somewhat in the form of a spiral coil; so that its progress would constantly tend to the upper chambers, and therefore a large surface be exposed to the action of heat, and a rapid generation of steam effected. The

flues are also contained in a case entirely surrounded with water, thereby bringing an additional surface in contact with a strong heat for the purpose of generating steam. With reference to feeding a boiler when required, a pipe is made to communicate with a cistern or water tank. Through this pipe water is made to enter the upper part of a cylindrical vessel, of such a shape that in the centre and at the lower end a kind of neck is formed for the purpose of regulating the admission of water into the boiler through this, by means of a valve; which valve consists simply of an ordinary piston or collar fixed to a rod and fitting into a conical seat made in each neck of the vessel.

There is also a vertical rod, which is jointed to a lever, at its lower end, and at the other end of this lever is a rod to which a float is suspended, so that as the level of the water in the boiler sinks, the lower valve will be opened by the ascent of the end of the lever which is attached to a vertical rod; the ascent being caused by the depression of the other end to which the float is fixed. The boiler may then receive a fresh supply of water, by having the upper valve opened by means of a rod connected with the apparatus, or by any other convenient arrangement. The advantages consist in being enabled to condense the steam in the boiler at pleasure, and also in warming the water previous to its admission into the boiler, whereby steam may be quickly generated. The inventor observes that these improvements admit of modifications, so as to be easily adapted to a variety of circumstances, and may be applied to either stationary or auxiliary boilers.

These improvements consist further in a method of carbonizing or coking fuel by a preparatory process previous to its use, causing the gases to become separated, their inflammable portions passing over a strong fire, and being thus availably consumed, which is accomplished as follows:—

A charge of fuel is placed upon a carbonizing plate over one fire and even with another; this charge being heated exhausts the gasses of the coal, which pass over the fire that is on a level with the plate, and are consumed, when the plate may be recharged. This principle may be easily applied to furnaces of various forms and descriptions.

These improvements further consist in regulating drafts, which is done by having a cylindrical vessel fitted with a piston, against which water from a boiler exerts a force when urged by an unusual pressure of steam from the chamber. This action causes a small rod, to which the piston is attached, to rise, and by its connection with a lever close the ventillation. Another mode is, by having an inner plate which slides backwards and forwards on rollers, to shut out the atmospheric air at pleasure from the first or second part, or from the whole of the chamber, and may be moved by hand or any convenient apparatus.

The inventor lays no claim to any of the above parts separately, but only as they are employed in connection to produce the effects above stated.

THOMAS ROBINSON WILLIAMS, of Cheapside, London, gent., *improvements in obtaining power from steam, and other elastic vapors or fluids, also in the means employed in generating such vapors, and also for using these improvements in connection with distillation, evaporation, and other useful purposes*, Oct. 14.—Claim first.—Mode of applying a cock and waste pipe for letting off the steam into the chimney, or in any other direction when the engine is not required to work; also in obtaining and making use of the power from the currents of steam or other elastic vapors in their passage from the boiler or vessel in which they are generated or produced to the cylinder of the steam-engine.

These improvements may be applied to any form of boiler, but will be most advantageously used in connection with the form of one as hereafter described. In the circular top of a boiler is inserted a cylinder, having two ends forming chambers, which should be about one-half or two-thirds of the capacity of the cylinder of the engine, to which it communicates by means of a steam-pipe. This engine is supposed to be working expansively, and to be furnished with the usual slide valves for that purpose; a small strong bevelled pinion is fixed upon the shaft above the stuffing-box; a wheel having cycloidal detent teeth upon its periphery, and its axis supported at its lower end by a steel point secured in a bottom plate, the upper end of the shaft being made to pass through an upper plate and common stuffing box. The small bevelled pinion transmits the power of this wheel to a bevelled wheel, the size of which must be regulated so as to give the required velocity to another shaft; the bottom part of the cylinder is of greater thickness than the other parts, forming a rim inside its lower edge somewhat wider than the thickness of the wheel with the cycloidal detent teeth. The inner side of this rim is to be accurately turned out before the bottom plate is screwed to it, so that the wheel may be made to fit nicely but without touching at any part; through this rim are cut a convenient number of thin slits, or orifices, so that the steam in its passage from the boiler to the chamber and the steam-pipe must pass through these slits or orifices with great force upon the cycloidal detent teeth of the wheel, thereby communicating a high velocity and a great amount of power, before the steam in the cylinder arrives at the same degree of pressure as in the boiler, and the time again arrives for the slide valve to open for the admission of steam from the chamber to the cylinder of the steam-engine. The machinery may be stopped by a clutch box, situated in any convenient manner. These improvements may be applied to many useful purposes, either to a separate engine, or in the process of distillation, or whenever steam or elastic vapors are necessary to be raised. Another part of these improvements consists in a long bent tubular boiler of diminished diameter, which allows of great strength and equal capacity; it is suspended in the middle by bands of iron, and is enclosed in brickwork, and is entirely surrounded from end to end by a flue which leads to the chimney.

Claim second—The several arrangements or combinations of machinery, as herebefore described.

Claim third.—The several described arrangements and combinations, as separate and distinct means for producing and obtaining power, when applied to all boilers and generators, as well as in connection with the peculiarly-formed boiler above described, or when used in the process of distillation or warming buildings, or other purposes, and thereby producing power.

ENTERED AT THE PETTY BAG OFFICE.

(*Continued from p.* 244.)

JOSEPH WHITWORTH, of Manchester, engineer, *improvements in machinery or apparatus for cleaning and repairing roads and ways, and which machinery may be applied to other purposes*, Oct. 14.—Claim first.—The construction of machinery for raising soil and other loose material from the surface of the ground, and depositing it in a vehicle attached.

Claim second.—Construction of apparatus for collecting the soil, before it is raised.

These effects are produced by an apparatus of the following description:—A covered cart is suspended by means of springs and bearings from a main axle, on one end of which one of the rotary wheels is fixed, and on the other end the other wheel turns loose. A toothed wheel is keyed on the same axle, which gears with another toothed wheel on a short cranked axle, working in suitable bearings with a clutch attached, acted on by an ordinary handle. A lever is adjusted on an axis at one end, attached by bearings to the frame of the carriage, and at the other end connected by a loose joint to one end of an arm; at the other end of this arm the scraper is affixed in connection with an inclined plane, which leads to the top of the cart or carriage, in which there is an opening. To the sides near the inclined plane are fixed two rods with rollers; the bottom of the inclined plane is a short distance from the ground, and this space is filled up by three plates or scrapers, which overlay each other at their ends, and which are joined to the inclined plane by a hinge-joint at the line of junction. There is also a strong iron frame-work connected to the back of the cart by suitable arms. To this frame are fixed scrapers which are each acted upon by a spring to give them sufficient force. To the frame are fixed two rollers, with a handle for the purpose of raising the frame in the event of its meeting with any obstruction in its progress.

The action of the machine is as follows:—On the cart being drawn forward, the wheels will revolve, and motion be communicated to the cranked axle by means of the revolution of the toothed wheel on the main shaft; this cranked axle moves a short arm connected with the lever, which in its turn acts upon the arm to which the scraper is attached, in such a manner as to cause the scraper to ascend the inclined plane with the soil or loose material before it, which on its reaching the top of the inclined plane is deposited in the cart; and when that is filled, the contents may be easily withdrawn by means of a sliding bottom, or any other convenient arrangement. After the soil is deposited in the cart, the scraper is guided off the inclined plane by the two projecting rods with the rollers to some distance, when it falls on the ground just outside the soil collected, and again ascends the inclined plane as before; the whole being performed by the revolution of the wheels in the onward progress of the cart. A circular broom, or series of brooms or brushes, on an endless chain, may be made to answer the purpose of the scraper by a very simple arrangement; the motion in this instance being also communicated by the rotation of the wheels.

Claim third.—The application of a scraper, broom, or other instrument, ascending an inclined plane by means of the rotation of the wheels.

Claim fourth.—The application of locomotive wheels for the purpose of raising and depositing soil and other loose material in a vehicle attached.

NOTICE.

In accordance with the determination expressed in our 26th Number, of giving one month's clear notice to Inventors, before publishing their specifications, we hereby inform the following Patentees, that their specifications will be published in the "INVENTORS' ADVOCATE" of Dec. 5. Each party will receive, in addition, a *private* communication to the same effect.

James C. Davies, College-place, Camden Town, jeweller, due Nov. 23.

Henry A. Taylor, Milk-street, Cheapside, merchant, due Nov. 28.

Alexander F. Camphell, Great Plumstead, Norfolk, and Charles White, Norwich, mechanic, due Nov. 28.

Edmund Leach, Rochdale, Lancaster, machine-maker, due Nov. 28.

Daniel Gooch, Paddington-green, engineer, due Nov. 28.

William H. Smith, York-road, Lambeth, civil-engineer, due Nov. 28.

George H. Bursill, River-lane, Islington, due Nov. 28.

*** *The specification in No.* 63, *headed* Charles Hume, *should be* Charles Keene.

AMERICAN PATENTS.

(From the "*Journal of the Franklin Institute.*")

For an improvement in steam boiler furnaces; Lucien Maillard, city of New York.

This improvement, it is said, "will give an economy of more than one-third of the consumption of fuel, by the combustion of dead steam"—a gift, certainly, of no small importance. By dead steam is meant that which has performed its office in the cylinder, and this is conducted through suitable tubes into hollow grate bars, under the furnaces of high-pressure boilers, whether of locomotive or

other steam-engines. From the hollow bars the steam is to enter the fire through numerous holes in them, made for that purpose.

Claim.—"I do not claim as my invention the introduction of waste steam into, or amidst, the red hot incandescent coals in the furnace for the purpose of increasing combustion by its decomposition, this having been previously done, but not in the manner in which I effect it. I therefore claim as my invention, and desire to secure by letters patent, the introduction of waste steam on, or amidst, the red hot incandescent coals, by means of the arrangement of conical tubes, and hollow perforated bars, on which the coals rest, in the manner described."

There are several grave questions connected with the invention that is the subject of this patent, which we have not time to discuss, but which we will not entirely dismiss. To the theory that the water is decomposed, and aids the combustion in consequence of this decomposition, we have not yet, and do not now, give our assent; but this is a matter of no importance practically, provided the combustion be actually rendered more efficient by its agency, which we do not dispute. Steam, and water, have been carried into hollow perforated bars, with the same view as that above declared, but, so far as we are informed, the plan has been universally abandoned. The bars must, necessarily, when in contact with the fire, be frequently out of order. In locomotive engines the waste steam is wanted to increase the draught in the chimney, and if diverted from this object, and applied elsewhere, a balance of accounts will have to be struck, and this, we apprehend, would be against the sending the waste steam into hollow bars, so far as locomotives are concerned.

For an improvement in applying heated air to furnaces, economising fuel and consuming smoke; Frederick P. Dimpfel, city of New York.

By the improvements in the supplying of heated air to furnaces which form the subject matter of this patent, we are informed that "a great saving is effected in the quantity of fuel employed; the smoke and combustible gases which ordinarily escape combustion are wholly or in great part consumed, and the sparks given off by the fuel are arrested."

A good general idea of the construction of the apparatus may be obtained from the claim, which is as follows: "What I claim as my invention, and desire to secure by letters patent, in the above described apparatus, is the employment of a box, or receptacle, constructed in the manner set forth, and which is to contain a stratum of pebble stones, or of any other material which will leave interstices through which air may be forced to pass, but which will have the effect of producing pressure within the furnace, which is supplied with air from a suitable blowing apparatus, and in which furnace the air is to be forced into a closed ash-pit, the whole being combined and arranged substantially in the manner set forth.

"I also claim the mode described, of forcing in with the atmospheric air a portion of that which has previously passed through the fire, by which means it is made to enter, in consequence of the pressure to which it is subjected. I claim, likewise, the manner of shutting off the draught from the blowing apparatus, by the opening of the door for feeding the fire, as set forth."

For an improvement in the blacksmiths' tuyère Iron; John Shugert, Elizabeth, Alleghany county, Pennsylvania.

The patentee says, that "the improvement which I am about to describe is on the tew-iron, for which I obtained letters patent of the United States, dated March 31, 1836, in which the blast from the tew iron entered the fire at an inclination, say of 45 deg. This elevation of the blast was found to produce beneficial results, but some inconvenience was experienced from the tendency of the coal to rise, or fly up, when the blast was given with considerable force, through a round nozzle—an inconvenience which is effectually removed by my present improvement, which is productive also of other advantages." This improved plan consists in making the opening in the forge back oblong, instead of round—say from two to four inches in length, and from three-eighths of an inch to an inch in height—the tube leading to this opening is to assume the proper form as it approaches it, and it may be divided horizontally, by one or more partitions, which will prevent the falling in of coal through the openings. The claim is to the oblong form given to the openings, in combination with the elevated blast.

FOREIGN INTELLIGENCE.

FRANCE.

FRENCH REVENUE.

The following table of the receipts of indirect taxes for the nine months of the present year, compared with those of the corresponding period of 1839, showing an increase of 26,123,000 francs, is published in the *Moniteur*:—

	1840.	1839.
Registration Stamps, &c...	167.763,000	160,932,000
Customs, Navigation, &c...	66 424.000	61.833,000
French Colonial Sugars ..	23,236.000	19 759,000
Foreign Sugars	3,076.000	2,526,000
Indigenous Sugars	2,663,000	2.511,000
Salt Dues, Consumption..	5.441,000	5.415,000
Potable Liquors	65,548,000	63,760,000
Public Carriages and other indirect taxes ..	23,769,000	22,954,000
Tobacco Sales	69.674.000	66,278.000
Gunpowder Sales	3.933,000	3.655.000
Salt Dues (Extraction) ..	38,992,000	37,973,000
Letters and Duty on sending Money	29,557,000	28,749,000
Ditto, Rural Service	1,703,000	1,651,000
Mails and Packets	2,260,000	1,985,000
Fr.	504,039,000	477,916,000

The French administration of customs has just published a general table of the commerce of France with her colonies and foreign parts during the year 1839. The following are the principal results compared with those of preceding years, in order that we may be able to form a correct idea of the situation and progress of the foreign trade of the country.

General Commerce and Special Commerce, (value expressed in millions of francs).

IMPORTS AND EXPORTS COMBINED.

	1839	1838	1837	1836	1830	1827
General Commerce	1950	1893	1565	1866	1211	1168
Special . .	1328	1315	1083	1193	942	920
General Imports	947	937	807	905	638	566
Special —	650	656	569	564	489	414
General Exports	1003	965	758	961	618	602
Special —	677	659	514	629	453	507

We thus perceive that 1839 does not present so great an advance as 1838, yet there is an advance. General commerce, imports and exports together, presents an increase for 1838 of 3 per cent, and special commerce 1 per cent; and for the five preceding years, the former presents an increase of 17 per cent, and the latter of 16. Compared to the average of the five preceding years, the increase is almost equally distributed between general and special trade, as it is between exports and imports: but compared to 1838 we perceive that there has been a diminution in the imports of the articles of special commerce, and that the increase has more particularly been in favor of general exports.

THE COUNTRIES TRADING WITH FRANCE.

General Commerce.—The following, placed according to the amount of transactions, are the countries with which the trade has been carried on. Imports: 1 the Sardinian States; 2 United States; 3 England; 4 Belgium; 5 Switzerland; 6 Germany; 7 Turkey; 8 Russia; 9 Spain; 10 the English possessions in India; 11 the Low Countries; 12 Guadeloupe; 13 the Two Sicilies; 14 Bourbon; 15 Tuscany and the Roman States; 16 Prussia; 22 Austria, &c. &c. Exports: 1 United States: 2 England; 3 Spain; 4 Switzerland; 5 Sardinian States; 6 Belgium; 7 Germany; 8 Algiers; 9 Brazil; 10 Asiatic Towns; 11 Tuscany and the Roman States; 12 Low Countries; 13 Martinique; 15 Spanish possessions in America; 15 Russia; 16 Turkey; 22 Austria; 25 Prussia; 32 Portugal, &c.

BELGIUM.

The attention paid by the government of Belgium to the manufactures of that country is well worthy of imitation in England. Instead of regarding the details of manufactures as objects beneath their notice, we find the ministers anxious to become personally acquainted with the different processes of manufacture, and desirous to encourage improvements. M. Liedtz, the Minister of the Interior, accompanied by the Minister of Public Works, recently paid a visit to Charleroy and the manufactories in the neighbourhood, for the purpose of inspecting them, and of seeing the state of advancement and activity which the works in that part of the country had attained. They were accompanied in their progress by several scientific men and manufacturers of eminence. This visit of the ministers to the workshops of the manufacturers occasioned much pleasure to the workmen and to every one interested in the manufactories, as manifesting a desire on the part of the government to promote and encourage the products of national industry.

The parliamentary commission of inquiry into the state of trade and manufactures, were treated with much consideration by the chamber of commerce and manufacturers at Namur. The iron manufactures formed the principal subject of investigation. The manufacturers urged the necessity of imposing protecting duties against the introduction of English cast iron, which arrives in great quantities at Antwerp, as ballast for ships. The advantage of entering into commercial relations with France, in preference to Germany, was enforced, because the iron manufactures of Namur being inferior to those of Germany, no market for them could be expected in the latter country. The manufacturers protested against the wood and charcoal of Belgium being sent into France, and they protested also against the clearing of the forests, as a measure which might, in a short time, seriously injure their manufactures. The depression which at present exists in the iron trade of Belgium was attributed to the large quantities produced, in proportion to the consumption of the country. The majority of the members present, who were mostly iron manufacturers, recommended as a remedy for the present state of commerce the diminution of differential duties on goods imported in foreign ships, on all articles but those of their own manufacture. All other manufactures they were of opinion should be exposed to foreign competition, as a means of increasing the exports of Belgium by favoring the articles of foreign produce.

The commissioners, when they come to make their report of the different opinions they have collected, will be sadly perplexed by the opposing views of the different branches of trade and manufactures, each of which is for protection to its particular industry, and very liberal in its commercial policy on all other articles.

As the railroads in Belgium are entirely under the management of the government, the ministers consider it a part of their duty to examine personally the operation of the system, and also to decide on the plans for the completion of the roads. The

Minister of Public Works lately visited the line of railway from Mons to the French frontier, for the purpose of determining the position of the railway station at Boussy, the terminus of the Belgian portion of the line. The station there, it is said, will give foreigners entering Belgium from France a favorable idea of the country.

EXPORTS FROM ANTWERP.

During the month of September, the exports of refined sugar from the port of Antwerp were 716,240 kilogrammes of loaf, and 114,279 kil of moist sugar. During the month of August, the exports were 829,756 kilogrammes of loaf, and 165,999 kil. of moist sugar; which, compared with the preceding month, makes a diminution for the month of August of 113,516 kil. of loaf, and of 51,720 kil moist.

Among the articles of Belgian manufacture exported from Antwerp we remark the following, the quantities being estimated by weight or value :—Woollen cloths, 179,480 francs; books printed and stitched, 51,268 francs; provisions, 155,822 francs; bleached linen cloth, 74,242 frs.; ditto unbleached, 137,767 francs; ditto, for sail-cloths, 2,940 francs; embroidered tulles, 23,150 francs; new carriages, 6,000 francs; oak bark, 562,000 kilogrammes; nails, 53,891 kil.; machinery, 57,516 kil.; undressed flax, 36,001 kil.; ivory black, 33,475 kil.; rolled zinc, 61,632 kil.; ditto, not rolled, 65,000 kil. Among the articles sent to Holland, by land, we remark the following :—books priuted, 13,650 frs.; bleached linen, 42,014 frs.; unbleached linen, 27,351 frs.; ditto for sail-cloth, 21,320 frs.; new carriages, 18,975 frs.; nails, 143,428 kil.; machinery, 174,474 kil.

The Council of Regency at Brussels, wishing to re-establish in the schools under their control that uniformity in the method of teaching the Flemish language which so many different systems of orthography has interrupted, has appointed a commission to make a report of the orthographical system which it will be most advisable to adopt for general use, and to name the works most advisable to be used. The substance of this report is, 1st, that the Flemish orthography which is decidedly the most to be preferred is that written by Desroches in 1761. It is the one which was approved by the Empress Maria Teresa, and the one which has received the sanction of time. 2d, That the grammar, a second edition of which was published a short time ago by M. F. Bon, is the one which has made the most improvement on this system, and which ought consequently to be used in all schools supported by the town.

The government of Liege has appointed a commission for the purpose of examining which kind of apparatus is best calculated to be a means of safety against accidents in the mines.

NAVIGATION OF THE DANUBE.—"The new treaty for the navigation of the Danube," says the *Frankfurter Journal*, "which has just been concluded between Austria and Russia, stipulates that the river shall be open to ships of all nations, but that Russia shall have the right of imposing quarantine regulations on vessels bound to any of her ports on it, and also that she shall receive a due of one colonnat, or Spanish piastre, about 5f. 50c., for each ship entering the river, on condition of her keeping the Sulino mouth clear from sand."

RAILWAY INTELLIGENCE.
DOMESTIC AND FOREIGN.

RAILWAY TO CORNWALL.—The Great Western Railway Company have offered to undertake the construction of a railway through the county of Cornwall, if the sum of £200,000 be raised in the county.—*Cornwall Royal Gazette.*

EASTERN COUNTIES.—The railway works are proceeding at Springfield with great vigor, the men working night and day; the embankment stretches its gigantic bulk with much more celerity than could have been expected, and it is evident that the sinews of railroading as well as of war are not wanting.—*Essex Standard.*

GLOUCESTER AND BIRMINGHAM.—One line of rails has been laid down between Cheltenham and Gloucester, and experimental trips have been made during the past week. At the commencement of November, when this distance will be open, there will be only about eight miles left at the Birmingham end to complete the whole undertaking.—*Cheltenham Free Press.*

WIND AGAINST LOCOMOTIVES.—A Correspondent of the *Morning Herald* mentions the following curious fact, from which it would appear that the tractive power of the locomotive engines on the South Western railway, is not sufficient to counteract the force of the wind against the train when blowing hard :—On Monday last the half-past one o'clock train left Southampton with a considerable number of carriages. The engine employed (it is believed the Eclipse) was not of sufficient power to keep the requisite speed to reach the final station at the time specified in the "time-table." Previous to reaching the Andover-road station, the wind got such mastery over the steam, as actually to carry the train back for nearly a mile, and it was half an hour before a lull allowed the train to proceed. This happens frequently at this point, and might be obviated by having a small engine-house built here, with an engine in constant readiness, to be fixed at the back of the train, upon the plan adopted by the coaches, of having post horses in readiness to carry them over the hills. Being Monday, at every station there were persons waiting to get up to town by the several trains, and thus, in consequence of these delays, did not reach Nine Elms until six o'clock, instead of fifty minutes after four o'clock; consequently the *fast* three o'clock train must have been within a few yards of it for nearly one-third of the journey.

CONVICTION AND IMPRISONMENT OF AN ENGINE-DRIVER.—At Marylebone Police Court, on Tuesday, *Joseph Jobling*, a young man employed as "engine-driver" on the London and Birmingham railway, was charged by the officers of the Company, under the new Railway Act, with gross misconduct. The first witness examined was William Tanner, the principal "breaksman" between the Camden-town and Euston-square stations, who said,—On Sunday night, as I was about to take the nine o'clock mail train from the Euston-square terminus, and was attaching it to the rope, intending immediately to start, I looked up the incline, and observed a light near, as I imagined, to the Hampstead-road-bridge. I perceived it was an engine coming down the same line upon which the train was. I immediately desired one of the men to knock off the "messenger" (a short rope by which the train is attached to the main rope), and also gave orders to another person to put the red light on, as signal for the engine which was coming towards us to stop, and it fortunately was stopped at a distance of about twenty yards from the train. I asked the prisoner what he had come down on our line for, with his engine, and he replied that Mr. Parker had sent him down to fetch the Yorkshire train. I told the inspector that that was certainly wrong, as I never knew an engine to be sent down for that purpose. Mr. Frederick Parker, foreman at the engine station, Camden-town, deposed that the prisoner was drunk, and denied most positively that there was any truth in the statement made by the prisoner, that he (Parker) had sent him down with the engine. Mr. Hardwick, the magistrate, committed the prisoner for two months' imprisonment at hard labor in the House of Correction.

RAILWAY ACCIDENTS.

FATAL ACCIDENT ON THE SOUTHAMPTON RAILWAY.—A serious accident, attended with the loss of one life, and severe injuries to many other passengers, occurred on this railroad on Saturday evening, owing to one train running into another that was in advance, in a similar way to the recent accident on the Eastern Counties. The following particulars of the accident, taken from the *Times*, are given as semi-official :—

"We regret to announce the occurrence of a fatal accident upon this railway, near the Nine Elms station, on Saturday evening. On inquiry at the station, we found that this unfortunate occurrence had taken place under the following circumstances—A mixed train had left Southampton at half-past 1, and should have arrived at the Nine Elms station at a quarter past 5. From the greatness of the load, this train, although drawn half the distance by two engines, was 35 minutes beyond its time, and did not therefore arrive at the London station until 10 minutes before 6. About 100 yards from the arrival-shed at Nine Elms, the engines which had drawn it were, as usual, detached from the train, and a rope by which the carriages were drawn under the arrival shed was fastened to them. Unhappily, as this operation was proceeding, the fast train, which had left Southampton at 3 o'clock, and which became due at Nine Elms at 6 o'clock, arrived; and owing to the hazy state of the atmosphere, and the omission of the person who had the care of the signal lamp, the driver of this train was not aware that his passage into the shed would meet with any obstruction, and a collision between the trains was the consequence. It appears that at some considerable distance from the point where the former train had stopped for the detachment of the engine, there is a signal lamp, at which a man is posted, whose particular duty it is, by turning a red or green glass over the light, in case of any obstruction at the station, to announce to any engine or train, which may be approaching, that there is cause (if the light be red) to stop altogether, or (if the light be green) to approach with great caution; and it became his duty, on the very late arrival of the train, which should have arrived at a quarter past 5 o'clock, and the anticipated arrival of the fast train at 6, to give notice to the latter by displaying the red light. We learn that this person was at his post, but, as his conduct on the occasion may become the subject of investigation hereafter, it may be better not further to notice it, than to state that the lamp was not made to exhibit any signal of danger; and the second train, its driver not being able from the state of the atmosphere to see the train before him, and having no notice of any unusual obstruction, came in contact with the hindermost carriages of the other train. The shock was, undoubtedly, a severe one, although no damage appears to have been done to any person or property in the second train. We regret to state that the effect on the first train was more serious. A female servant, named Elizabeth Andrews, who was seated in the last carriage, was killed by the shock. She had, with a fellow servant, been down to Hampton Court, and her death was, so far as our information reached, instantaneous. Her fellow-servant, although seated beside her, sustained but little injury.

"Of the other sufferers we heard of one who was severely injured in the body, and had, it is believed, some ribs broken. There were, we regret to add, several other contusions and injuries, of more or less severity, but we have not been able accurately to ascertain the extent of them."

One of the passengers by the train gives the following description of the scene :—

"I was passenger in the Southampton half-past one o'clock train, having travelled to London from the Walton station. We arrived at Nine Elms about 6 o'clock, nearly an hour after the regular time. The train had stopped, and the passengers were preparing to disembark, when the 3 o'clock fast train came up with most frightful velocity, and the tender came in forcible collision with the train that had just preceded it. The concussion was terrific. I received a severe contusion on the nose and forehead, and when I recovered from the concussion, I heard the most piercing screams. I got out, and rendered what assistance I could to those near me. I found a young lady saturated with blood, which was pouring from her face in a stream,

On examining the source of the bleeding, I found her nose nearly severed from her face, from her having fallen on the glass in front of the *coupé* in which she was travelling. When I had stemmed the torrent of blood, my attention was directed to others who had by this time been got out of the carriages, and were conveyed to one of the private rooms. During my divided attention, a respectable looking female was carried in. When I examined her, I found her a lifeless corpse, and had only to direct that her body should be removed from the view of those who were wounded."

An inquest was held on the body of Catherine Andrews on Tuesday. The evidence disclosed great want of proper management on the railway, and the absence of signals to show there was a train in advance. The signal light near the station, which should have been turned to show the signal of danger, exhibited the white safety signal. The engine-driver of the Eclipse, therefore, conceived the line was clear. The speed at which he brought in the engine was stated by the guard to be from five to eight miles an hour. The carriage in which the deceased was killed was not very much injured. She had been for some time past in a delicate state of health. The coroner, during the investigation, prevented a gentleman who was a passenger by the train, and had suffered injury, from suggesting any questions to the witnesses. The jury returned the following verdict:—"We find that the deceased was accidentally killed, and we place a deodand of THREE HUNDRED POUNDS on the Eclipse locomotive steam engine, the property of the London and Southampton Railway Company. We attribute the accident to a want of proper caution in hoisting a signal light to warn the driver of the Eclipse of the obstruction on the line. We cannot but deprecate the rate of speed at which the trains are brought up to the terminus."

The facts elicited at the inquest, held since the foregoing remarks were written, on the body of the woman who was killed at the collision on the Southampton Railway on Saturday, present a forcible corroboration of the importance of adopting the regulation respecting signals which we recommend. It appears, indeed, that the accident was entirely owing to the want of signals, and to the neglect of the man appointed to make them. Had the plan of having a constant stationary signal of danger been adopted no accident would have occurred. The opposite course, of showing a constant signal of safety, to be removed only under special circumstances, was followed, and the man whose duty it was to give the cautionary signal having been either absent or unmindful, the train was kept at its ordinary speed in the confidence derived from this deceptive signal. The absence of any notice would have been far preferable; for the engine driver would then have exercised the caution which, had he not been misled by the false indication of safety, he would have known to be necessary. One of the policemen appointed to show signals, who has been in the service of the railway since its opening, was so ignorant of the nature of the duties he had to discharge that he admitted to the jury he did not know what was the meaning of showing the white light. "I have never been told," he said, "that any positive meaning belongs to the white light!" Yet this man, uninstructed as to the nature of his duties, is placed at one of the most important points near the terminus, to give warning to the approaching trains of the existence of danger. In the exercise of his discretion—having no specific directions to guide him—he thought there was no cause to signalise caution to a fast train following five minutes after a slow train, on a dark foggy evening; the former having at the time no light behind.

The exposé at this inquest exhibits more completely than at any previous similar investigation the great want of proper management on our railways; and especially the unfitness, from age and education, of the "engine-drivers" employed to discharge their important duties uncontrolled by superior authority. We extract in this place the evidence given by the men themselves of their age and qualifications for the office. The engine-driver of the slow train, against which the other struck, said—

I have been on this line since February. Before this I had been on the Bolton, the Liverpool and Manchester, and Dublin and Kingstown railways. I have been engine-driver about eight years.

Had you received any scientific education as to the power of steam and the mode of conducting an engine?—I had not.

How were you brought up?—My father is a farmer, and I worked under him.

Oh, then, you have been brought up to the plough?—I have been.

What were you before you were made engineer?—I was a stoker on the Bolton line.

Why did your master make you an engineer?—Because he saw me competent, I suppose. I used to be sent on when an engineer was sick.

Juror—Mr. Coroner, here is an engineer who acknowledges that he has received no scientific education or training to fit him for a duty in the discharge of which he has many lives committed to his care. I submit that this ought to be taken notice of.

The Coroner—You have received no education to fit you for being an engineer?

Witness—No, except that of being stoker.

Is it usual to make engineers of stokers?—That is the way engineers are made. It is the same as serving an apprenticeship.

Then your only preparation is that of experience?—That is all.

The engineer of the fast train, which caused the accident, gave the following account of his engineering education and of his employment as engine-driver,—*commencing when he was only seventeen years of age.*

I am 22 years of age. I have been five years an engine-driver. I was three years on the Leeds and Selby line. I was a fireman for one year before. I have received no education for the place, unless what the driver I was under showed me; but I can set an engine right in case of accident, for I was in the workshop before I became a stoker. My pay is 7s. a day; no other driver has more; that is the general payment.

In speaking of the accident he said, "I lessened my steam at the Wandsworth cutting, as I always do, to see whether all was right; but, seeing only a white light, I got the steam on again, and we proceeded. There was no light behind the carriages of the other train. I am positive that, if I had seen a red light, the accident would not have happened. All the carriages have buffers and stops."

Such facts as these require no comment. The verdict of the jury, levying a deodand of THREE HUNDRED POUNDS on the engine, will not, we feel persuaded, go beyond, if it approach to, the amount which the public feeling on the case would sanction.

FATAL ACCIDENT FROM NEGLECT.—On Friday evening last a frightful accident, attended with loss of life, occurred at the Canterbury terminus of the Canterbury and Whitstable Railway. It appears from Tyler's-hill station the trains run down on an inclined plane, and that the rapidity of progress is usually controlled by means of a rope. On the above evening, however, this precaution was neglected. Six carriages, heavily laden with corn and fish, were suffered to proceed down the incline with nothing to check or steady them but the skids, which were rendered inoperative by the falling of a heavy rain. The train advanced with increasing and frightful velocity, broke down every obstacle that opposed it, and was precipitated from a height of 12 feet, crushing a man named Curd to death, while three or four others very narrowly escaped.—*Times.*

ACCIDENT TO A WAGON TRAIN.—The *Paisley Advertiser* states that last Saturday morning one of the engines was coming westward on the joint railway with a train of seven empty coal waggons that had been to the eastward with ballast and stones. The engine was last, and was driving the waggons before her at the time of the accident. At the moment when the engine was about to clear the west end of the tunnel, the foremost was driven off the rails by some means unaccounted for, and all the other six and the tender were thrown off and crushed together in a heap. There were about 27 men sitting in the waggons, a considerable number of whom were thrown among the wreck. There were about twelve or fourteen hurt. Of these four or five were able to come to town with some assistance, the other nine were laid carefully on straw, and were brought to the depôt in two of the waggons. There are only two cases considered very serious, but the extent of the injuries was not known. The engine itself was not thrown off the rails.

NARROW ESCAPE ON THE MANCHESTER & LEEDS.—On Wednesday, on the arrival of the last train from Hebden-bridge at the Sowerby-bridge station, from some cause yet unexplained, several of the carriages were thrown off the rails, and had it not been that the engine was in the act of stopping at the moment, and close to the walls upon which the shed is to be erected, in all probability the consequences would have been awful.—*Halifax Express.*

MISCHIEVOUS ATTEMPT ON THE TAFF VALE RAILWAY.—On Monday evening, as the train was on its way from Cardiff to Newbridge, it was violently thrown off the rails by the large root of a tree, which it was strongly suspected was purposely laid there. The spot where the accident occurred has a very high bank on the upper side, and a deep precipice on the lower. The train was thrown to the upper side, otherwise not only would the carriages have been destroyed, but many lives must have been sacrificed. [The *Merthyr Guardian*, from which we have copied the above, calls it a "mischievous attempt." It ought surely to be designated by some more criminal title. Such an act, even if done wantonly without any malice, is equal in atrocity to that of firing a loaded cannon among a crowd. The consequences in the one case might have been as serious as in the other.]

FOREIGN RAILWAYS.

COLLISION OF TWO TRAINS NEAR ANTWERP.—The train of merchandise which left Brussels on the morning of the 4th inst., arrived at Antwerp at ¾ p. 8, just at the time the train from the latter place was starting. The train from Brussels was proceeding with such velocity, that it could not be stopped when the signal was given; the consequence was, that the two trains struck against each other. A diligence was smashed to pieces. Young Belpaire, of Antwerp, brother to the engineer, who was in this train, had two legs broken. M. Verbert, who was in the same carriage, had his hand fractured. One of the guards was wounded in the heel. The engineers who caused the accident were immediately arrested. Messrs. Chuntrell and Eyckholdt, inspectors of the railroad, went immediately to Antwerp, to learn the particulars of this dreadful accident.

CUSTOM OF CONTINENTAL RAILWAYS.—The atten-

tion of the directors of the various railroads in this country is called to a very simple plan adopted by their continental neighbours for the protection of the public from the possibility of theft, in respect of *mistaking* another passenger's portmanteau for your own. It is this:—Every passenger who has luggage receives with his ticket a stamped number; this number is also affixed to his luggage, and the guard has a memorandum of the quantity of articles to which such number has been put. On arriving at the station which is his destination, he must produce the corresponding number which he has in his possession before any luggage is delivered up to him, and to avoid the chance of any one pulling the number off an article, and then producing it as a blind to obtain it, the number on the luggage and that given to the owners are printed in different colors. Some persons may object to this as causing some unnecessary delay, but that delay only occurs to those travelling with baggage. And any trifling delay occasioned by this method is more than counterbalanced by the security to their property which this system affords, and to the want of which security but too many persons in this country, who have suffered loss, can bear testimony.

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For the convenience of persons residing in REMOTE PLACES, *the* "INVENTORS' ADVOCATE" *will be regularly issued in* MONTHLY PARTS, *stitched in a handsome wrapper.* PARTS 1 *to* 16, ARE NOW READY.

ADVERTISEMENTS *should be sent in not later than* Thursday Evening.

TWO *numbers of the* "INVENTORS' ADVOCATE" *(Nos.* 48 *and* 49*) were published* July 4. *The former contains, in addition to the usual varied matter, the* TITLE PAGE *and a* Copious INDEX *to the* SECOND VOLUME.

VOLUME II. *of the* "INVENTORS' ADVOCATE," *handsomely bound, is* NOW READY. *A* FEW COPIES *of the* FIRST VOLUME *still remain on hand.*

The plan mentioned by "J. C." *for making canal boats roll over the water would not be found to answer. The friction, or resistance, of the many rolling surfaces would tend to impede the motion of the boat. The plan would also have the disadvantage of making the boat top-heavy, without in reality diminishing the draft of water.*

"Robert Johnson," *if he show his invention before it is patented must trust solely to the honor of the parties. The present law would afford him no protection. He will find some observations on this subject in another column.*

Civis *came too late for insertion for this week.*

"James Sperring's" *suggestions respecting railway accidents in our next.*

TO CAPITALISTS, MANUFACTURERS, AND TRADERS.

Among many VALUABLE INVENTIONS *and* PATENTS *registered at the* PATENT OFFICE, BRITISH and FOREIGN, (198, STRAND), *for the investment of capital, Shares are offered for sale in the following Useful Inventions:—*

A Fire Escape of Novel Construction, which may be used as an Observatory.

A Cheap Lamp for burning Tallow and Grease, without overflow or smell.

Patent Screw Jack, for lifting locomotives and other great weights.

An Improved Balance, applicable to small or great weights.

Important Improvement in Wood Paving.

A New and Improved Method of Burning Coke.

New Methods of Purifying and Treating Oils.

Patent Forge Back.

A new Castor for Furniture.

Patent Process for the Manufacture of Soda.

Improved Methods of Building Iron Ships.

A New Method of Tanning.

The Purification of Gas,

TO INVENTORS.

PERSONS WHO WISH TO OBTAIN OR DISPOSE OF PATENTS, *or to bring* NEW INVENTIONS INTO USE, *are requested to apply to the* PATENT OFFICE, BRITISH and FOREIGN, No. 198, STRAND, *opposite St. Clement's Church, where they will meet with great facilities to obtain information and to carry out their views.*

THE GALLERY OF INVENTIONS,

Attached to the Patent Office, is a spacious Saloon, well lighted, in which Plans and Models are exhibited. It affords an excellent medium for bringing New Inventions into public notice.

THE

INVENTORS' ADVOCATE,

AND

JOURNAL OF INDUSTRY.

SATURDAY, OCTOBER 24, 1840.

*** *The Office for the publication of* THE INVENTORS' ADVOCATE, *is removed from Tavistock Street, Covent Garden, to the Patent Office, British and Foreign,* 198, *Strand; opposite St. Clement's Church.*

The frequent and the increasing number of accidents on railroads, show more and more forcibly the necessity of adopting some plans to prevent their recurrence. We have on former occasions remonstrated against trusting the lives of several hundreds of passengers to the care of such men as are now appointed to manage and "drive," as it is termed, the locomotive engines. We are aware that an alteration in this respect must require time, for the proper class of men have yet to be educated and fitted for the employment; but in the meanwhile many arrangements might be made to give increased security, and greatly to diminish the danger which late experience proves attends this means of conveyance. These arrangements may be divided into those relating to the machinery of railways, and those more immediately connected with the management. The prevention of collisions, of which accidents we have recently had some fatal examples, comes more especially within the province of the management, and to these we shall, at present, confine our remarks and suggestions.

We would, in the first place, recommend that every train of carriages should be placed under the command of a trustworthy and intelligent conductor, or guard; whose duty it should be to keep a look-out, and give his commands to the engineer to regulate or stop the motion of the engines. At present the duties of the "engine driver" are greater than he can properly execute. He has not only to attend to the working of the engine, but his attention should be constantly directed to the road to see if all be clear, and whether there be any circumstances that require him to slacken the speed. Whilst his attention is withdrawn for one moment to the machinery, dangers may arise requiring immediate action to avoid; and it sometimes happens, that the danger presents itself so suddenly, as to deprive the engine-driver of presence of mind, and prevent him from acting with promptitude and effect. Some serious accidents have arisen entirely from this cause. Now, if a guard were appointed, from whom the engineer should receive all his orders, in the same manner as the engineers on steam boats do from the captain or pilot, and a constant and uninterrupted look-out could be maintained, the engineer would be ready at the instant to obey the orders of his commanding officer, without having his attention divided between the road and the engine.

On the Belgian railroads, which are much better conducted than most of those in this country, a guard is appointed, who regulates the starting and stopping of the trains by the sound of a bugle. He does not, indeed, exercise an absolute command in conducting the train, similar to that we now recommend, but he occupies a position on the first carriage, which enables him to assist the engineer in looking out for dangers. The evidence at the Coroners' Inquests lately held in this country on the persons killed by railway accidents, shows that the guards, who accompany our railway trains, consider themselves in no way responsible for the safety of the passengers. In some cases we find it stated, that the guards were sitting with their backs to the engines; at others they were engaged taking the tickets from the passengers, or seated inside the carriages. If a proper trustworthy guard were employed, as we recommend, to take the whole responsibility of giving orders to the engineer, we are persuaded that many of the accidents which occur would be avoided.

There is another regulation, with regard to signals, which might be advantageously and easily adopted, without any additional trouble. Instead of the temporary signals now made by means of white or red flags, held up by the policemen on the line, we would recommend that a *permanent signal of danger* should be hoisted, to be replaced only by the signal of safety, at the times the trains were approaching; provided the road was then clear and free from danger. By this means, all risk arising from the temporary absence of the men from their posts would be avoided; for if by neglect on their parts the danger-signal was not removed when no danger existed, the only inconvenience would be the short delay, whilst the man would be punished for his neglect, and kept to his duty, without any risk having been incurred.

These suggestions are made with a sincere desire to promote any improvement that may diminish the risk of railway travelling, and in the hope that railway directors may be induced to adopt either these or some similar plans for that purpose, without regard to the comparatively insignificant consideration of additional expense.

INJURIOUS EFFECTS OF THE PATENT LAWS.

To the Editor of the "Inventors' Advocate."

SIR,—I am the inventor of several new inventions, which have never yet been seen by any individual; but, being only a working man, I have not the means of bringing them out. I have one to supersede the present system of hanging sashes by

weights; consequently, there will be no boxing required in the sash frames.

I have another small instrument which will supersede the great number of bells used in large houses This instrumeot is somewhat like a clock, and will answer the purpose of any number of bells.

I have got others, but do not know what to do with them; perhaps, Sir, you will not think it too much trouble to drop a line and give your advice, so that I may not suffer the pain, disappointment, and cruelty, which generally fall to the inventor's share. If you can inform me of any safe channel, a letter from you will be received with gratitude. I am, Sir,

29, St. Andrew's-road, Your obedient servant,
Boro'. H. DALLIMORE.
Oct. 17. 1840.

The above is one of several letters received from inventors, who, from the want of timely patronage, carry with them to the grave many useful inventions, which are thus lost to society. We have suppressed some passages of the letter in which the writer indulges too freely, though not without reason, in remarks on the injustice inflicted by the patent laws. We have, also, omitted some details of the two inventions alluded to, lest they should disclose the inventor's plans. They both appear to be ingenious and useful, and if brought out would no doubt be turned to profitable account. Here, then, is an instance of a poor inventor, who, owing to the stupid intricacy of our patent laws, dare not entrust his secret to any one, for fear he should be robbed of his invention, and be debarred from securing his rights by a patent. In foreign countries a much more liberal system prevails. There an inventor can secure his rights at a trifling expense by depositing a description of his invention at the Patent Office. His priority of right is thus established, and cannot be afterwards disputed. Why should not that example be followed in this country? The real obstacle to this and to other improvements in the patent laws is the fee system, which absorbs all considerations of justice and right. The law seems to be made rather with a view to obtain fees for public officers than to secure the rights of inventors. It is against this system we declare war; nor shall we cease to attack it until the injustice and impolicy of the patent law be acknowledged and remedied.

POWER ACTING AGAINST ITSELF.

In a recent number, we gave a description of a new mode of applying wind power to propel boats, which had been exhibiting on the Thames, and we stated at the same time our opinion that it would be impossible by such application of the force of wind to make it act against itself. We have since received a letter from an ingenious correspondent, who is disposed to question our position; for, without having seen the boat in question, but judging merely from our description of it, he thinks that the wind might be made to act in that manner against itself, and he compares it to the plan adopted in the American rapids, of applying the force of the current to propel a boat against the stream. We would give our correspondent's letter at length, but it refers to discussions not before our readers, and would therefore not be understood. We shall, however, state his view of the case, and endeavor to show that the two modes of propelling against the acting power, are in principle and practice essentially different. In the first place we may observe, the air propeller which we described acts by the force of the wind striking against horizontal moveable vanes fixed to an axle, the revolution of which turns paddle-wheels that act upon the water. Now our position is, that as the only moving power is derived from the action of the wind on the vanes, it is impossible, by any disposition of machinery, to make that power act against itself; and that to cause a power to act against itself, some other force must be employed. Our correspondent appears to think that as the horizontal vanes turn round, the force of the wind on them would not act against the motion of the boat to windward. This is the great error into which he has fallen; for all the power exerted by the wind in turning round the vanes, would operate, in blowing the boat along with the wind, nearly as much when they are turning round as when they are stationary. All the power of the paddles acting on the water, to give the boat a direction towards the wind, would only be gained by the force of the wind acting in an opposite direction; therefore the utmost that could be done, allowing for no loss of motion by friction, would be to keep the boat stationary, when attempting to sail directly against the wind. The enlargement of the vanes would increase the power of the wind to move the boat along, at least in an equal degree to the increased effect on the paddles.

In the case of the boats which move up the rapids by the action of the water, as exhibited by a model at the Polytechnic Institution, the moving power is gained by the employment of an additional force —the force of re-action. Were the air propelling boat fastened by a rope passing round the axle to which the horizontal vanes are fixed, the winding of the rope round the axle would also move the boat directly against the wind in the same manner as the boats are moved against the current on the American rapids. In these cases, it will be observed, however, that the re-action of the point to which the rope is fixed, is equal to the action of the water; by which means the force of the water in carrying the boat down the stream is counteracted by the tension of the rope, and the force of the water or wind acts with the advantage of mechanical power equal to the difference between the circumference described by the paddles or the revolving vanes, and the axles round which the rope is twisted. The plan suggested by our correspondent, of employing the means now used in ascending the American rapids, in crossing currents of water, might, we have no doubt, be adopted, and, in many cases, with great advantage.

NEW INVENTIONS.

PHOTOGENIC DYEING.

M. Lapouraille, a dyer, at Lyons, has for some years past been endeavoring to bring to perfection a mode of dycing silks and cottons by solutions of metals alone, without the addition of any coloring matter. He found the solution of gold to be the best adapted for this purpose, and though he by this means contrived to produce beautiful lilac and violet tints on the silks, they were not durable, and the expense of such a mordant as a solution of gold induced him to discontinue his experiments. The plan he pursued was that of producing or deepening the tints to be obtained by exposure to the light, therefore it may properly be called a photogenic process. Though M. Lapouraille did not succeed to such an extent as he desired, he still conceives the plan capable of being carried into effect with great advantage; and for the purpose of directing attention to the process, and of assisting others who may wish to pursue the experiments, he has given the following account of those he instituted, with the results:—

In one third part of hydrochloric acid and two of nitric acid I dissolve some fine gold. I pour some distilled water into a vessel. I add to it a few drops of the solution of gold, and then put in my silks. Whether the silk be dressed or undressed the effect is always produced: but the color is more beautiful in white silk that has been dressed. After the silk has remained ten minutes in the diluted solution of gold, I squeeze it, and put it to dry without washing. The color that the silk has taken is a bright straw color; no change is perceptible on the first day; and, in the shade, not any on the second; but when exposed to the sun the silk assumes various colors, alternating from red to yellow and lilac; and by this variation of color forming changes of tints that disappear when removed from the sun. Unfortunately these tints are neither beautiful nor permanent beyond ten or twelve days at most. After this time the grey lilac, almost white, color that the silk assumes in the shade has only a slightly redder tinge when exposed to the sun, but the varying tints are lost. In order to obtain lilac as well as violet color, the acid must be extracted from the silks that have gone through the solution of gold. They are then exposed to the sun, and in a shorter or longer time according to the power of the sun a very fine lilac is obtained; in summer one hour is long enough, but in winter it requires eight days, fifteen days, and sometimes even a month. In a camera obscura I have obtained very pretty tinges of lilac in ten minutes. To procure tints as deep as violet, it is requisite to put the silk already tinged with lilac again into the diluted solution of gold; the color is not destroyed, it is rendered more bright. It is dried without being washed, the acid is afterwards extracted, and it is exposed to the sun; in a few hours the tint becomes twice as strong, and by repeating this process five or six times a beautiful violet color is obtained.

On paper and on cottons lilacs are obtained in the same manner, but the color is not so deep as it is upon silk. I have kept silks for three years dipped in a solution of gold. They had only a slight tinge of grey lilac, almost white, but after extracting the mordant and drying the silks in the sun, I have produced a very fine lilac twenty times deeper than it was before. All the lilac or violet colors which are obtained by the solution of gold, become red when exposed to the sun, to artificial light, or to a solution of alkalies; in the shade, or in contact with acids, they become blue; in the air they are unchangeable.

ARTIFICIAL SLATES.

The following process has been adopted, for the purpose of making pasteboard slates, so as to obtain all the advantages of slate, for writing or drawing, without the disadvantage of its fragility and weight. To one part of the pulp of common white paper is added an equal quantity of argillaceous earth. The substances must be kneaded together with linseed oil, and then pressed thin and shaped to the required sizes. These leaves of mixed clay and paper are well dried, polished, and then covered over with oil on both sides. The artificial slates thus prepared are not acted on by water, and scarcely by fire. They are, besides, very light, convenient, and very cheap.

SCIENTIFIC CORRESPONDENCE.

BRITISH ASSOCIATION AND THE HAARLEM LAKE.

(To the Editor of the "Inventors' Advocate.")

SIR.—At the late meeting of the British Association at Glasgow, some interest was excited in the department of mechanical science, by allusions made to the draining of the Haarlem Lake, in Holland, and the production of the model of a scoop proposed to be employed for that purpose.

In the statement of the proceedings as given in the daily journals, a well-known engineer has expressed an opinion that the draining of this lake could be accomplished by the application of a Cornish engine of from 200 to 300 horse power, attached to a scoop of 30 feet square, the one end of which was made to move on the centre. In the bottom of this scoop, which requires to be curved, are to be several valves opening upwards on the side nearest the engine. In other words such a scoop is to form a sort of an immense sieve fitted with valves. We are then informed that the engine of this great power, 200 to 300 horse, will be able to lift 17 tuns of water each stroke, and make 7 or 8 strokes a minute.

Any authentic data on so important a subject as the draining the lake of Haarlem, where more than 60,000 acres of the richest land in Holland have been for so long a period wholly lost, cannot fail to be interesting to the general reader, while supplying valuable matter for grave reflection to any proprietor of land or agriculturist in whatever country.

As my pursuits as a civil engineer have lately brought me into personal communication with the Dutch commissioners on the part of the King of Holland during their stay in London, with a view to get information on the best means of carrying out their great national project, I am enabled to state that the estimated quantity of water required to be raised for draining the lake is about 800,000,000 tuns, equal to about 26,500,000,000 cubic feet. A portion of this to be raised to an altitude of 7 feet, a farther portion 14 feet, the residue to be discharged at a lift of 16 feet.

To raise and carry off so immense a body of water, by water wheels, scoops, Archimedes' screws, friction pumps, hydraulic belts, or any such machinery, would occupy an almost indefinite period of time, and prove a ruinous waste of money.

The London Patent Hydraulic Company have however undertaken to supply the Dutch Government with machines, which with an effective force of steam power shall raise 1,600 tuns of water per minute, or 2,304,000 tuns of water per diem of 24 hours, and which machines, when in full work, will deliver in a uniform flow a stream of water equal to a canal or river 225 feet wide by 2 feet 4 inches deep.

This undertaking is founded on working data. There is nothing speculative or uncertain in it. The company have been delivering for some time past in limited local drainages 20 tuns a minute, or 16,800 tuns per diem of 24 hours; one of these on the estate of Sir R. Sheffield, Bart., where the water has to be occasionally discharged at an altitude of 11 feet, producing a constant stream of 9 feet wide by 14 in deep. For this a 10 horse engine only is employed.

The machines are simple in their construction, and most effective in operation. They can be worked with equal advantage; in the ratio of the force employed, either by manual labor, horse or steam power. I am, Sir,

Your obedient servant,
JOHN BEARE.

6, Great Newport-street, Long Acre.
London, Oct. 12.

(To the Editor of the "Inventors' Advocate.")

SIR,—Your respected correspondent, Lieutenant Morrison, makes an inquiry respecting a paper which Mr. Utting states was forwarded to the Uranian Society, *prior* to the reading of Mr. Saull's paper on the transition of the poles. I beg to observe that this unimportant misunderstanding entirely arises from a trifling error on the part of Mr. Utting; the paper alluded to being transmitted *subsequently* to the time assumed. I received it in the form of a letter, dated "Lynn Regis, 7th Aug., 1840," and extracted that portion of it which related to the subject pending.

I am, Sir,
Stepney. Yours respectfully,
Oct. 17, 1840. J. M. CAVALIER.

(To the Editor of the "Inventors' Advocate.")

SIR,—I beg to acknowledge the *error* pointed out by Lieut. Morrison, stating that my paper was sent to the Uranian Society before Mr. Saull's paper on the subject was read. The fact is it was written previously, but was not sent to the secretary until Aug. 7, the receipt of which was acknowledged previously to Mr. Saull's paper being published in the *Inventors' Advocate*. I was of course quite as unacquainted with its contents as I should have been agreeable to my first statement.

My paper was written in answer to opinions given by Mr. Saull in a pamphlet published by him, as may be seen by my referring thereto.

In regard to the transition of the poles (*i. e.* the consecutive motion of the obliquity) having any effect on the waters of the ocean. Now, I expressed it as follows; viz. "*if* the waters of the ocean, &c." This was introduced in consequence of its having been recently asserted by certain theorists that such an effect might be produced by the motion of the perihelion point of the earth's orbit; or by the precession of the equinoxial points &c., one being just as likely as the other to produce such an effect. As to the new geological theory of *mine* I shall probably be able to prove ere long,* that this theory is supported by geologists of no mean acquirements. I am, Sir,

Lynn Regis, Yours respectfully,
Oct. 19, 1840. J. UTTING.

ORIGINAL REPORTS OF SCIENTIFIC MEETINGS.

(Contributed expressly to the Inventors' Advocate.)

MICROSCOPICAL SOCIETY.

Oct. 21. Professor Owen, F.R.S., President, in the Chair.

The following gentlemen were elected members—Mr. S. Cartwright and Mr. James Heward; and as an associate, Mr. Waterhouse, Curator to the Zoological Society. The first communication read was from the Rev. Vernon Harcourt (in a letter to the president,) being remarks "On the cause of the change of color of matter found in a pond at Nuneham."

Mr. Harcourt's attention was first attracted to the subject by observing the brilliant masses of red which appeared in the pond in the morning and seemed to disappear in the evening. On examination he found it was the food of a larva resembling that of a gnat, through the transparent body of which it passed with little alteration of color for some time. It became rather browner after it had been eaten several times. It was capable of being taken up in largeish pieces like the skim of boiled milk, and upon being again put into water resumed its former flat shape on the surface; but after being kept for some hours in a glass the continuous films were completely resolved into small particles which went to the bottom. Mr. V. Harcourt imagined it was vegetable matter and showed it to Mr. R. Brown, who showed him the red snow which had been brought by Ross and Parry, to which its globules bore in size and color a strong resemblance. Mr. B. thought them very like one another, but did not consider them the same thing: the water containing the red matter had become putrid, by which means the animals (for such Mr. H. afterwards discovered them to be) had been killed. They appeared to be identical, as far as the genus is concerned, with *Cercaria mutabilis?* of Shaw's miscellany, *(mutabilis* for change of *shape* not of *color)* Shaw seems to have supposed that there were two species, a *green* and a *red* one, one of which he says is more common than the other. Though the mass of united animals looks green, there may always be discovered with the microscope in each animal the red spot, which, when dilated, gives the red color to the film; and it is very difficult to keep the animal in the *green* state. When they were placed in a wine glass in the house they quickly became red. Some were carefully collected and placed in a basin in the open air, and the films remained united, and went through this regular change for three days, after which the creatures fell to the bottom, *remained red*, and appeared *dead*. The only good opportunity of examining them in their green state was by the side of the pond. The masses consisting of a *single film* or of a multitude of animals, adhering closely to one another, side by side, began to turn green (passing through shades of brownish purple) about 4 o'clock; the green color is produced by the red interior contracting towards a *vent* near the tail, which has not been noticed by Shaw or Ehrenberg. Mr. H. saw the process of dilatation going on in several instances, the animal being stretched out at full length, with the mouth and vent open. Mr. H. thought he saw, but it was only for two seconds while the animal was moving (with a single lens focus 1-30th inch) a fringe of membranous feelers round the mouth. They are very sluggish, living in general in summer in a state of complete quietude, except in so far as they are moved by wind or water: after they are once separated they never again unite in the mass. When it rains they go to the bottom of the water. They begin to change from green to red about 6 o'clock in the morning (in July). The sleep of these creatures in its relation to time, light, and heat, seems to resemble that of some plants, but as to the effect which motion has in disturbing them, to come near that of animals.

[In our next week's number we will continue the report of the present meeting, by giving Mr. Bowerbanks' interesting remarks on a "new structure in fossil wood," from the London Clay of Herne-bay, Kent.]

BOTANICAL SOCIETY OF LONDON.

Oct. 2. John Edward Gray, Esq, F.R.S., President, in the Chair.

The secretary announced seven certificates of new members for ballot at the next meeting, also 17 parcels of British and foreign specimens of plants for the herbarium, and for distribution. Mr. C. Blundy presented a series of ferns from St. Michael's. The following plants were exhibited;—a viviparous variety of *Trifolium repens (clover)*, from near Worcester, and a similar variety of *Cardamine pratensis (ladies smock)*, from Newart, Gloucestershire, both presented by Dr. R. J. N. Streeten, of Worcester. Specimens of the rare British fern *Aspidium cristatum*, from Edgefield Heath, near Holt, Norfolk, were likewise presented. Dr. Streeten presented a specimen of the rare moss *Hypnum fluitans*, from a rivulet near Malvern Hills.

A communication was read from Mr. Arthur Wallis, being a continuation of his remarks on the "*Flora of Essex*," comprising the natural order *Ranunculaceæ* (crowfoot tribe). The object Mr. Wallis has in view in presenting the society with a series of papers, is to add his quota of practical information, in order to enable British botanists at present engaged in drawing up tables and remarks illustrative of the geographical range of the commoner species in Great Britain, to elucidate the peculiarites of at least the county of Essex; and with this view he has commenced on the natural system of Decandolle, with the order *Ranunculaceæ*, the localities being given on his own authority only. In this communication he described the range of the species comprehended in the orders *Ranunculaceæ* (crowfoot tribe), *Berberideæ*

* In answer to Mr. Cavalier.

(barberry tribe), *Nymphæaceæ* (water-lily tribe), *Papaveraceæ* (poppy tribe), and *Fumariaceæ* (the fumitory tribe). The meeting then adjourned.

URANIAN SOCIETY.

Oct. 6. *W. H. White, Esq., Vice President, in the Chair.*

A paper on Electricity as connected with Astronomical Phenomena, by G. Whipple, Esq., was read, of which the following is a notice:—

Electricity embraces and controls the whole of nature, whether viewed as developed in chemistry, galvanism, magnetism, &c. We have a demonstration of its power in producing heat and light, and this one circumstance would suggest an analogy in connection with similar phenomena exhibited in the planetary system: and it is not unreasonable to conceive that eletricity regulates the planets, in their several orbits, and preserves the stupendous, whole,—since by its agency the rocks of the earth stand forth bearing the imprint of peculiar fossil remains; in fact, every region appears to have been occasionally a theatre of subterranean convulsions. The earth, the sea, and the atmosphere afford evidences of its universality.

Du Faye and others advocated the existence of two fluids universally diffused; that they are infinitely subtle and elastic, and each repulsive of its own particles, but attractive of those of an opposite kind; these forces being equal at equal distances, and varying inversely as the square of the distance, Coutomb supposed the two electric fluids to be possessed of equivalent properties, neutralising each other's elasticity like oxygen and hydrogen combined. Ritchie, however, argued that it was independent of fluid,—that bodies when excited merely rotated on their axes; or that their individual molecules all moved round.

A hollow sphere may exhibit equal intensity as a solid globe; we, however, question the application of this to our earth, since in the case of a hollow sphere the particles are comparatively homogeneous, while in that of our globe they are heterogeneous, a vast assemblage of electrics and non-electrics, exciting and inducing until that degree of intensity has been acquired, combination ensues, and announces the phenomenon, the products of which are now becoming so familiar to the enlightened geologist, in spite of bigotry and superstition; products which, it has been observed, form as it were the great charnel-house of preceding generations.

The effects produced upon our globe by the agency of electricity are evidence that that power controls the earth as a mass, and if so, can we do otherwise than infer its connection with the motions of the earth as a planet. Solar light and heat are evidently electrical phenomena, and these are the effects of the sun's action. If then the primary source of motion be under the influence of electricity, that power must also obtain in the intermediate states of planetary motion.

The meeting then adjourned to the 3d November.

FRENCH RAILWAYS.

The French Chamber of Deputies appointed a commission to examine the different railways and projects of railways formed and contemplated in France, with a view to consider in what manner and to what extent the government should interfere in assisting the execution of those works. A report, drawn up by Baron Charles Dupin, has been published, which after noticing the different railways in detail, sums up the general recommendations of the commissioners in these terms:—

"Let us hope that if the Government decides on constructing railways of a considerable length, it will rather fix its choice on such lines as are of the greatest importance both commercial and political, and situate in those parts where the wealth of the population is less capable of sustaining the exponses of the enterprise. The east and west of Paris are the most natural and proper directions to be chosen by the Government; in a northern or westerly direction private capital abounds, and commercial traffic is immense. The Government has only to show itself favorable to the companies, and they will form themselves with eagerness.

"We propose engaging the State to the amount of 40,000,000f., 10 of which will already be paid in 1846, and to engage the State for a guarantee of interest, which at the most will amount to 1,000,000f. per annum.

"If the Chamber of Peers accept the project this year, France will have the prospect of possessing the following works:—

Enterprises entered into by citizens.

	Extent.
15 railways completed in service ..	406,000 kilom.
Eight in process of construction ..	418,000
	824,000
Railways to be undertaken by Government	70,000

"Were we only to state the average cost of the railways undertaken by companies at 300,000f. per kilometre, we should find that, on the whole, private enterprise will have brought to a term 23 railways, in total extent 206 leagues, at an expenditure of more than 247,200,000f.

"The State will in the meantime have undertaken from 16 to 17 leagues of railway for 24,000,000.

"The most desirable object to effect now would be filling up the lacunæ between Paris and Lyons, Paris and Strasburg, Rouen and Havre, representing a total length of only 220 leagues, or about the same length as has already been undertaken by private enterprise, notwithstanding its faults, its hesitation, the discredit it at first deserved, and then so dearly paid for.

"The projected law which we have just examined will, undoubtedly, greatly hasten the desired period when these two lacunæ will cease to exist, when the Rhine will no longer maintain with our internal means of conveyance a competition the more dangerous, as the Bâle and Strasburg railway in some sort opens to Switzerland the ports of Holland in preference to our oceanic ports.

"The enlightened good-will which the Government at present evinces, by the various and effective assistance which it has held out to national industry, will bring forth such salutary fruits as will effectually reanimate the spirit of association.

"In the meantime, if it be desired that the interests of the public should be effectually protected from the encroachments, the groundless pretensions, and even from the ingratitude of these associations, for such consequences must be expected when our commerce is with men, the Government must, within the shortest period, present us with a general law, in which the official relations between the Administration and the companies shall be laid down according to the various financial systems in practice. This law would be most successfully worked out in the Chamber of Peers, with a view to the mutual interests of the State and citizens.

"We must reiterate the expression of our regret that we should be deprived of the power of amending this law—on the one hand, introducing further conditions favorable to the companies without other inconvenience; and on the other hand, by giving the State greater means of protection from the possible abuse of the guarantee which it has granted. But in consideration that a year's delay would introduce many and serious inconveniences, more than counterbalancing such advantages, we have the honor to propose to the Chamber the simple adoption, in its present form, of the law respecting the following six railways:—From Paris to Orleans; from Strasburg to Bâle; from Andrezieux to Reanne; from Montpellier to Nimes; from Belgium to Lille; and from Belgium to Valenciennes.

SCIENTIFIC MEMORANDA, AND NOTES ON ART.

Discovery of Antediluvian Remains.—On cutting through a rock on the approach to the bridge building over the Ourthe, near Telff, a great quantity of fossil remains have been discovered, belonging to the largest species of carniverous animals. Many centuries must have elapsed since the vast quantity of sehist which cover these antediluvian remains could have been formed.

Effect of the Worm on Ship Timber.—At a recent meeting of the Institution of Civil Engineers, a letter was read from Mr. John Cooper, of Dover, describing the effect of the worm (*teredo navalis*) on several kinds of timber which had been exposed to the action of sea-water. The kinds of timber on which the experiments were made were fir, English oak, and African oak; specimens of each sort, some Kyanized and the others unprepared, having been tried under exactly similar circumstances on the piles of the south pier of Dover harbour. The results show that Kyanizing timber does not in any degree protect it from the worm; as, after exposure from December, 1837, until May, 1840, it was found that equal ravages had been made in all the specimens. The author also tried the process of saturating timber with copperas water, but did not find any good result from it. In July, 1835, he placed under water some two-inch oak planks which had been prepared with copperas; and on examining them in May, 1840, they were found to be as much attacked by the worm as the worst specimens of unprepared fir timber which had been exposed for a similar length of time. The African oak resisted the attack of the worm better than either fir or English oak. It was stated that teak timber resisted the attacks of the worm and the white ant, which destroy all other kinds of timber. It is, however, liable to injury from the attacks of barnacles.—*Berwick Warder.*

New Description of Cotton.—A new species of cotton has been discovered by L. C. Hornsby, of Covington, Louisiana. He says the bush grows from eight to ten feet high, branching out in proportion, and producing from 2,000 to 3,000 lbs. to the acre. This cotton is of long staple, and very fine texture. Mr. Hornsby thinks it as fine as ordinary silk. He says one seed was found two years since in a chest of tea imported from China. He planted it, and saved the seed which was its production; planted them, and now offers a few for sale. If this cotton proves as good as represented, we can then count upon a new era in the cultivation of the great staple.—*New Orleans Bulletin.*

Domestic Use of the Anthracite.—M. Michael Chevalier has published an article in the *Revue Generale* of Architecture and Public Works, upon the use of anthracite as an article of domestic economy. He states that in the eastern parts of Pennsylvania, where there is no coal, the deficiency is supplied by the existence of large carboniferous beds, containing anthracite, the use of which has now not only nearly superseded that of wood in Philadelphia and the neighborhood, both in manufactories and for domestic purposes, but is preferred by many families resident in New York, Boston, Baltimore, Washington, and other towns in the states. It is used either in stoves or grates, and gives less trouble than any other kind of fuel. The principal difficulty seems to be in lighting it, but when once it is made to burn, it does not easily go out, and blazes the moment it is stirred. Iron is never used in the construction of the fireplaces, as its coming in contact with any material which is a conductor of heat prevents it from burning well.—*L'Echo du Monde Savant.*

Durability of Modern Buildings.—It is well known that the dilapidated state of many stone buildings and erections, even of modern structure, led to the appointment of a commission to ascertain the best kind of building-stone to be used in the erection of the new Houses of Parliament. After an examination of a great many quarries and buildings, it was ultimately resolved to employ that stone which was used in the erection of the collegiate church of Southwell, in Nottinghamshire, which is in a remarkably fine state of preservation. Many of the buildings in the metropolis are memorable instances of the folly of using perishable stone, which is chiefly owing to its having been excavated from the top of the quarry, where it is generally of a very porous nature.

New Medical Treatment in Germany.—At a meeting of the Westminster Medical Society on Saturday, Dr. J. Johnson called the attention of the meeting to a new mode of treating disease, which has lately come into vogue in Germany. This is called hydrosudopathy, and it consists in subjecting the patient to the external action of hot and cold water alternately, accompanied by copious draughts of the latter. The patient is first wrapped in blankets, and made to perspire plentifully. He is then plunged into a cold bath, and having remained in it a short time is taken out, and made to walk about quickly, till he gets warm again. He drinks cold water while in this state, and some persons have been known to swallow the enormous quantity of four or five gallons. He is then put into bed, and a second perspiration takes place. If it should be difficult to bring on perspiration again, the object is found to be speedily attained by wetting the blankets before the patient is wrapped in them. This method is used in all complaints, even in cases of violent pneumonia. Dr. Johnson did not seem to have a very high opinion of its efficacy; he stated that he had conversed with many German physicians on the subject, and the result he arrived at was, that it was not attended with those disastrous consequences which at first sight might be expected from it. He illustrated the matter by the Russian custom of rolling in snow immediately

after quitting the vapor bath, which he had himself witnessed. The method of hydrosudopathy was invented by a Bohemian peasant, named Presnitz. Another gentleman who spoke stated that the new mode was already on its decline in Vienna, where it had been longest known.

Malaria.—It is not a mere theory, but a well-founded opinion, that all the destructive epidemics that have afflicted this globe have had their origin in malaria, which in a cold climate has produced typhus fever; in a more temperate one, plague and yellow fever; and within the tropics, cholera—each modified according to the idiosyncratic state of the sufferers. Hippocrates, Virgil, Seneca, Justin, Tacitus, and many others who have transmitted to posterity accounts of various epidemics which have at different times destroyed large numbers of mankind, have all remarked that they were preceded by heavy rains and intense heat, and that these seasons were almost invariably to be prognosticated by the appearance of a comet. A few examples may be enumerated. Ancient Rome was subject to frequent epidemics, generally caused by inundations of the Tiber. In the year 81 of the Christian era, after a severe rainy season, succeeded by intense heat, the mortality was so great as to carry off 10,000 citizens daily. In 1374 it is narrated by historians that this year was marked by a comet, by excessive rain and heat, and succeeded by the most dreadful mortality that we have any record of, and by which two-thirds of the human race were destroyed in a very brief period. Many places were entirely depopulated; twenty millions of mankind died in the East in one year; 100,000 perished in Venice; 50,000 were buried in one grave yard in London; grass grew up in the streets of cities hitherto most populous, and people fled in boats and ships to sea, regardless of property and friends.—*Colonial Magazine.*

A Fossil Tree.—Some days ago a large petrified tree was discovered in Cowcaddens-quarry. It was unfortunately broken a good deal by the workmen, otherwise it might have remained a very fine specimen, 16 or 17 feet in height. It is now quarried nearly to the root, but betwixt two or three feet are still standing, while the fangs are seen branching out in all directions. The tree is about six feet in circumference, and the bark is perfectly distinct. The surrounding rock is a coarse quartzose sandstone; and the rest of the tree is now composed of precisely the same material with good large white pebbles intermixed.—*Glasgow Chronicle.*

Electrotype.—This name is given to the process, or result of the process, by which copies of medals, coins, engraved plates, &c., are obtained through the agency of voltaic electricity or galvanism, and the last number of the *Polytechnic Journal* contains a very extraordinary example of the applicability of the new art to the reproduction and indefinite multiplication of copperplate engravings. The plate of an ornamental ticket for the Stanhope and Tyne Railroad Company, most elaborately engraved, has been copied by Mr. Backhoffner, of the Polytechnic Institution, in a style which renders the prints from the two plates, different as is their origin, to all appearance identical. The impressions are, indeed, in every respect so similar, that were it not for the information afforded by the subscriptions, it would be impossible to tell which is the original, which the copy. In every new art there are difficulties to be overcome, but after seeing these specimens we cannot doubt the practicability of producing electrotype copies of the finest engravings. It is indeed wonderful that the discoveries so recently made by M. Jacobi, of St. Petersburg, and Mr. Spencer, of Liverpool, should have already become available to so many useful purposes. With regard to the economy of the process, it is observed that an engraving on steel similar to the ticket of which an example is given would cost £25. Printing 100,000 copies at £2 per 1,000, would come to £200, making the whole cost £225. On the other hand, with the electrotype, a steel engraving would not be necessary, and the cost of one in copper may be estimated at £20. From this plate let ten electrotypes copies be taken, for £1 each. The ten plates may be soldered together or locked in one frame, so that 10,000 impressions at £6 per 1,000 will be equal to 100,000 from the single steel plate, and the whole cost, according to the estimate, will be only £90. But another very important advantage may be expected from this process—namely, that the engraver will be enabled to supply at all times good impressions from his work. The original plate need not be submitted to the press, but may be preserved for making electrotype copies, to the number of which no limit can he assigned. Thus it may be presumed that the progressive improvements of this art will so cheapen engravings as to render proofs and fine impressions always obtainable at a moderate price.—*Times.*

India Rubber.—This most remarkable article, which, only a few years ago, was sent to this country as ballast, now sells in a fine state as high as 10s. to 11s. per pound when spun into thread. One firm spins as much India rubber thread every week as would reach from London to Canton, the country it is imported from. There are twelve patents for this article, and these patents have cost more to defend in law than the amount paid for India rubber since the article has been known to us as of any value. Experiments are now making in England and France to apply the article to the cure of consumption.

An invention is in progress to supersede the necessity of using horse-hair for stuffing chairs, sofas, &c. The substitute is cork, cut into the minutest particles, which is found upon trial to be superior to horse-hair in every respect, and the saving is considered at about 200 per cent. —*Morning Herald.*

The most ingenious invention of weaving glass with silk is proceeding with great success. The patterns wove are beautiful in the extreme, and have induced many of the nobility to select them for curtains and other ornamental furniture.—*Morning Herald.*

Specimens of Natural History from South America.—M. Claussen, a Danish naturalist, who has resided for many years in the interior of Brazil, has just landed at Antwerp, with a considerable quantity of the natural productions indigenous in the most unknown countries of that vast empire. These collections, which constitute almost the whole cargo of the Belgian ship, the Caroline, are intended to be distributed among the royal museums of Paris, Copenhagen, London, Berlin, St. Petersburg, &c. The plants, which are alive, amount to more than seven thousand; and, notwithstanding the disadvantage of a stormy passage of 85 days, they are generally in an excellent condition. The Royal Horticultural Society of Belgium, at the request of the owner of these plants, have placed them into their beautiful conservatories in the Botanic Garden, at Brussels, where they can receive the care and treatment, which, after so long a voyage, they necessarily require.

Theory of Waves.—In illustration of the theory of waves, it is recorded in the *Literary Gazette* that, on Sept. 1, 1839, a fir tree about 40 feet in length, and covered with great *barnacles*, was drifted across Dover harbour, and towed into that port. It is supposed to have been parted from the American shore by a hurricane, and borne on its long voyage across the Atlantic by the tidal action of the waves.

Thames Water.—The average saline contents of filtered Thames water amount, according to Brande, to about 20 grains in the imperial gallon, and are as follows:—

Carbonate of lime	14·5
Sulphate of lime	4·0
Common salt	1·5
	20 0

Traces of magnesia and ammoniacal salts, and of organic matters, are also found, together with other substances, resulting from local contaminations by sewers, gas-works, and various manufactories, and which, together with suspended and insoluble particles, often render Thames water in particular places quite unfit for use.

Meteorological Summary of the Weather for 1839, drawn up by Dr. Armstrong, the Retreat, South Lambeth.

Number of days for the greater part rainy	43
——————— fair	69
——————— fair throughout, but cloudy	227
——————— cloudless	4

Artificial Preparation of Sugar.—Sugar similar to that of grapes may be prepared by boiling one part of the starch of potatoes, or flour, with from one-hundredth to one-tenth part of sulphuric acid, and four parts of water; care being taken to renew the water as it evaporates. At a higher pressure and temperature, the change may be effected more rapidly with a smaller quantity of acid. The excess of acid is then to be saturated with lime, the sulphate of lime separated, and the liquid concentrated by evaporation. Grape sugar may also be prepared from saw-dust, linen rags, or paper shreds. Twelve parts of linen rags should be mixed gradually with seventeen parts of concentrated sulphuric acid, or with five parts of sulphuric acid and one of water. The temperature must be moderate. After twenty-four hours, the mass is to be mixed with a quantity of water, and boiled for ten hours. It is then to be neutralized with chalk, filtered, and evaporated to the consistence of syrup, and crystallised.

Rich Iron Ore in Ulverstone.—A correspondent at Ulverstone has sent us a specimen of iron ore obtained within two miles and a half of that place. It is reported, he says, to contain 95 per cent. of iron. One specimen, of ten pounds and a half weight, has been purchased and forwarded to Lord John Russell by our correspondent, in order to be presented to her Majesty. He adds, that from 700 to 800 tons of this ore are raised weekly, and the bulk has 67 per cent. of iron. Steel ore is also found amongst it.

Danger of Employing Coal-tar as a Preservative from Dry Rot.—It is stated as a fact well worthy of notice, and as accounting in some measure for the late rapid combustion of the Talavera, at Devonport, that she was one of those ships on which the plan of impregnating the timbers with coal tar, as a preventative from dry rot, was tried. A piece of her timbers, which was examined, is completely saturated with this material.

Native Mineral Paint.—In the process of sinking a shaft in search of coal, on the Shane's Castle estate of Earl O'Niell, near Belfast, a substance has been found (and of which an extensive stratum has been traced) applicable for use as a mineral paint. It occurs at a place called Dunrankin, and can be raised in large quantities ready for use, by merely grinding in oil, which it does perfectly smooth, of good body, and of a bright reddish brown. A gentleman, to whom specimens have been submitted, states it to be an ochreous earth, two-thirds oxide of iron, and one-third alumina; that for common out-door painting, as houses, gates, and carts, it is particularly applicable, and may be used for floor and oil-cloth, paper-staining, &c., also ornamental imitations of woods, of which his Lordship has a variety of tablets, prepared, which have a very good effect. With gum-water it has also been tried as a water-color for mapping.—*Belfast Chronicle.*

The Human Body.—There are nearly 10,000 organs in the human body, and each of them has a multitude of parts, which are themselves divisible, until we arrive at atoms subject to molecular affinities. Then setting out from this point, ascending from harmonies to harmonies, from one organic sphere to another, we arrive at the *ensemble*, the whole, the sensitive unity. This is man. But of what does this vital and plastic force consist? What is the bidden bond, the primordial element, which generates this surprising variety of actions? The unknown quantity in this problem has not been discovered. All parts of the body have life, but not *a tife*, and yet they converge towards this unity with an admirable concord; every faculty terminates and loses itself in the abstract and hyperorganic faculty of personality. By what means does nature effect this great phenomenon? The triple scale of ignorance still covers our feeble eyes. What problems to resolve! What veils to lift! What depths to sound!—*Medical Gazette.*

Causes of Deafness in Chitdhood.—There are not a few practices adopted towards children that have a most injurious effect upon the ear. Washing infants with cold water is sometimes practised, with a view to making them hardy, as it is called; whether it has this effect may be doubted, but it certainly is very efficacious in producing severe cold, and consequent deafness. The heads of newly-born infants are commonly bound up in flannel caps, tightly tied on, by which the ears are flattened close to the head, their natural position being somewhat prominent; and by the same means they are prevented from receiving such distinct and vivid impressions as they otherwise would, and are consequently less powerfully exercised and developed. Every facility should be afforded for calling the powers of the ear into moderate and duly regulated exercise; but constant exposure to very loud sounds, by over-exciting the organ, tends to enfeeble and injure it—*J. Curtis's Advice to the Deaf.*

VARIETIES.

"Steamers Wanted."—The *Sydney Herald* has for the last two years been calling out for a supply of steam-boats for our Australian colonies. Steam-boats are said to be now urgently wanted on the following lines:—"Two large steam-boats to run from Port Phillip to Sydney; a large boat to run from Sydney to New Zealand; a second to be added in about 12 months; three boats to run to Hunter's River; a boat to run to William's River; a boat to run to Brisbane Water; a couple of small boats to run between Newcastle and the different towns on the Hunter, Williams, and Paterson. Besides the above, a boat will be required to run to Twofold Bay very shortly, as the country between there and Manaroe, called the Bija country, is beginning to attract attention; boats for Jervis's and Bateman's Bay will soon be required. We consider the above boats are required at once, in addition to those now here, for there will always be some of the vessels meeting with accidents, and otherwise requiring repair, and it is of the greatest importance that boats should run regularly. Although the above are urgently required, we believe that the only boats that can be depended upon, as sure to arrive during the present year, are two for the Hunter's River Company, and one for Port Phillip. Half a dozen vessels of different burdens sent to this colony would be a splendid speculation."

Two Harvest-Homes in One Year!—A farmer living at Paxford, near Camden, Gloucestershire, has finished harvesting twice this year, not having got in the whole of the last year's crop till the 1st of January.—*Cheltenham Free Press.*

Bees.—Never kill a bee. The cottager, who, even now, is sorry to be forced to do so, has in the *fungus maximus*, or puff ball, a powerful instrument, ready to his hand, by which he is enabled, without any trouble or expense, to adopt a more humane as well as more profitable mode of treatment. The smoke of this fungus, when dried so as to hold fire, has a stupifying effect on bees, and renders them as harmless and motionless as brimstone does, without any of its deadly effects. By means of this, weak swarms and casts, which would not live through the winter, may be united to strong stocks. This was discovered by a Swiss pastor, De Gelieur. He stated it as an extraordinary fact, and borne out by experiments, that a hive thus doubled will not consume more honey in the winter than a stock in its natural state. The additional heat seems to serve, instead of additional food, to keep up the vital functions of the half-torpid bees. He recommended a dry dark room, the colder the better, as the best winter quarters for bees. They will consume less honey than if left on their sunny summer stands, and will not be weakened by the loss of the thousands which are tempted out by every bright December day, and which, when caught by the cold winds, fall to the ground, and never rise again. Dryness, however, is essential.

Buoyaney of Bodies after Death.—There has been much discussion as to whether bodies sink or swim when thrown into the water, after having been killed. Considerable discrepancy of opinion exists upon this point. It has been maintained that strangled persons will float more readily than others. Caracciolo, Admiral of the Neapolitan navy, was hanged by sentence of a court-martial. The body was committed to the deep in the usual manner, and 13 days afterwards, whilst the King was walking on the deck of Lord Nelson's ship, he suddenly exclaimed with a yell of horror—*Viene viene!* (he comes! he comes!). The Admiral's corpse breast high, was seen floating towards the ship. The shot which had been attached to the feet, for the purpose of sinking the body, was not sufficiently heavy.

Naval Engineers.—The Lords of the Admiralty, with a very proper estimation of the importance of this class of warrant officers, &c., from the sons of commissioned officers seeking employment as engineers' apprentices, issued their orders that they should not be set to work in any *menial capacity*. After this, it will be scarcely credited that they are actually employed as *stokers* in Woolwich dockyard, where

they are retained for the purpose of qualifying themselves as third engineers, within a given period. We would wish to call the attention of the authorities to another leading feature of the system pursued in the appointment of "third" engineers from this very factory, into her Majesty's steamers, a measure fraught with the most imminent peril, some results of which have been fully exemplified: the gentleman conducting this department must be fully conscious of the vast difference between the shore-going "engine-driver" and the sea, and yet men who have never smelt salt-water, are fearlessly entrusted with the safety of the steamers, and the lives of the officers and men, whilst youths every way qualified for the situation, as being brought up in the service, are passed over because they have not accomplished the probationary term of five years! We trust this glaring evil will meet a remedy.—*Kentish Mercury.*

American Steam-engines.—Two large steam-ships are building at New York for the Spanish Government, and one for the Russian. Mr. Norris, the engine-manufacturer of Philadelphia, has received an order from Frankfort on the Oder, for 15 of his best locomotives.

Preservation of Flour.—M. Robineau states that by very strongly compressing flour into rectangular moulds it may be preserved both from damp and insects; the bran being previously separated from it. A cake of flour thus prepared has been kept in a damp cellar six weeks, without injury.—*Athenæum.*

The *Presse* announces that 75,000 muskets, with percussion locks, had been ordered by the government at the manufactory of St. Etienne, and remarks that this is the largest order of the kind which has been given since the wars of the revolution.

Grave-yards of the Metropolis.—DRURY LANE BURYING GROUND, belongs to the parish of St. Martin's in the Fields; —many thousands of bodies have been here deposited. The substratum was, some years since, so saturated with dead, that the place "was shut up" for a period. The ground was subsequently raised to its present height—*level with the first floor windows surrounding the place*, and in this superstratum vast numbers of bodies have, up to this period, been deposited. A short time since a pit was dug (a very common practice here) in one corner of the ground; in it many bodies were deposited at different periods, the top of the pit being covered only with boards. This ground is a most intolerable and highly dangerous nuisance to the entire neighborhood. Rather more than two years ago, in making three areas to the centre houses on the western side of this burying-ground, many bodies were disturbed and mutilated; the inhabitants of the houses are frequently annoyed by the most disgusting and repulsive sights.—*Gatherings from Grave-yards of London, by G. A. Watker, Surgeon.*

Ginger.—The ginger of commerce is the underground stem (rhizoma) of the *Zingiber Officinale*, which is said to be a native of the East Indies, and to derive its name from, and abound in, the mountainous district of *Gingi*, to the east of Pondicherry. It is cultivated all over the tropics of Asia and America. The herbaceous parts of the plant wither in December: the rhizomes are dug up in January; but when it is intended to be preserved in syrup, it is dug up when the shoots do not exceed 5 or 6 inches in height. For preparing the dried ginger, the best pieces are selected, scraped, then washed, and dried in the sun with great care. This is called *white ginger*; in contradistinction to which, the rhizomes which are scalded in boiling water before being dried, are denominated *black ginger*. The confected or preserved ginger is prepared by scalding the green rhizomes till they are tender, then peeling them in cold water, and putting them into a thin syrup, from which, in a few days, they are shifted into the jars, in which they come home, and a very rich syrup poured over them, which is sometimes 3 or 4 times renewed.—In Jamaica the shifted syrup is diluted with water, and fermented into a pleasant liquor.—*Brande's Pharmacy.*

May Bugs.—An agriculturist of the department of La Seine Inferieure has discovered a new method of destroying May-bugs. He procured a couple of the birds called Kuikimanore from the Sandwich Islands, and taught them to eat these insects. During the season he lets them loose at night, and they return in the morning, after having, according to his calculation, destroyed at least four thousand. These birds have bred under his care, and he has now 100 couples.—*Athenæum.*

Coinage in the reign of George III.—There was coined in the entire reign of George III. in gold, to the value of £71,639,213, and in silver £4,306,120, of which fourteen millions were coined in 1816 and 1817.

A grain of gold is 20 *miles*, and a mite is 24 *droits*; a droit is 20 *periots*, and a periot is 24 *blanks*; used in weighing precious stones.

Horticultural Notice for October.—Upon a warm south border now sow frame peas, beans (Mazagan); lay into the ground purple and white brocoli, within a few inches of their lower leaves, letting their heads, says Prof. Lindley, face the north. The transplantation of the following vegetables should now take place; cauliflowers and purple brocoli under frames and hand glasses; cabbages, garlic, shalots, black-seeded Gotte and Bath lettuces under frames; lay up carrots, potatoes, and red beet for winter use; tie up endive and celery. If asparagus is required for winter it must be forced by hot-beds, which should now be made, and remade every three or four weeks; make up mushroom beds. Now gather the fruits for the fruit-room; some of the plums may be hung up by their stalks and placed inside the panes of a south window for some weeks. Borders should now be trenched, and fruit trees transplanted against walls, also plant out cuttings of gooseberries and currants. But the principal part now is the fruit in the fruit room; at Holkham apples are preserved in great perfection by being laid in casks in alternate layers with others of sand; and the light should be constantly excluded.

Children Employed in Mines.—The *Gazette* of Tuesday announces the appointment of Commissioners for inquiring into the employment and condition of children in Mines and Manufactories. After the legislature had admitted the necessity of interference for the protection of children employed in factories, it seems extraordinary that the still larger number of children employed in the other manufactories of the kingdom, and underground, should have been so long overlooked.

A table of mortality for the metropolis, registered in the week ending Saturday, the 10th of October:—Males, 417; females, 377. Total, 794.

An accident is said to have occurred at St. Petersburg during a trial made of a newly-invented bomb, which explodes on touching the object against which it is fired. An ammunition wagon was fired at, but did not for some time explode, on which the General of Artillery, Bontemps, rode up to inspect it, and just reached it as it ignited. The General was so much injured by the explosion that he died after 11 hours of great suffering.

Launch of a large Steam-ship.—On Thursday afternoon last a great number of persons assembled at Northfleet, near Gravesend, to witness the launch of the Mongibelle steam-ship, the property of the Steam Navigation Company, from the dockyard of Mr. Pitcher, shipbuilder. The vessel, which is intended for the kingdom of the Two Sicilies, is 500 tons burden, and her engines 200-horse power. The launch took place at three o'clock, and the vessel was named by Duke Stanta Theodora of Naples, who was accompanied by several distinguished Neapolitan and other gentlemen.

The Nassau Balloon.—It gives us pleasure to be able to inform our readers, upon the very best authority, that the famous aeronaut, Mr. Charles Green, intends next summer ascending from Dublin in the great Nassau balloon, if the current of air be favorable, passing over England without descending, and ultimately making his descent somewhere on the continent of Europe. Mr. Green is preparing for the press a work on aerostation, and we have reason to know that he holds firmly his resolution of trying the voyage from the new world to the old, across the Atlantic, as soon as he shall have constructed the kind of balloon which will be necessary for the purpose.—*Limerick Chronicle.*

Witchcraft in Watches.—Aubrey, the antiquary, relates a whimsical account of the terror occasioned by a watch, which was an uncommon article in his time. He states that a Mr. Allen, who was reputed to be a sorcerer, being at Home Lacey, in Hertfordshire, happened to leave his watch in the chamber window; the maids came in to make the bed, and hearing a thing in a case cry tick, tick, tick, presently concluded that it was his devil (or familiar), and took it by the string with the tongs and threw it out of the window into the moat to drown the devil. It so happened that the string hung on a sprig of an alder that grew out of the moat, and this confirmed them that 'twas the devil. So the good old gentleman got his watch again.

ADVERTISEMENTS.

TO MANUFACTURING CHEMISTS, VITRIOL MAKERS, PLUMBERS, AND OTHERS.—DELBRUCK'S PATENT AUTOGENOUS SOLDERING PROCESS, the new mode of uniting lead to lead and other metals, without solder, by intense jets of flame.

Licences are now ready to be granted, and the process may be seen in operation at the Lead Works of Andrew Clark and Son, Bear Garden, Southwark, the Patentee's Agents.

POTTS' PATENT PICTURE RAIL MOULDING, AND APPARATUS FOR SUSPENDING PICTURES.

The Public is requested to inspect specimens of the above invention, which may be seen daily at 17, King William Street, Strand. It combines an elegant moulding with the rod or tube, and is so architectural in effect, that it is adapted for the gallery, or any room or place where pictures are usually hung. It affords the greatest facility in hanging a collection, and can easily be put up without damage to the walls, however finished or decorated.

THE "NE PLUS ULTRA" BLACKING,

ROBERT SARGEANT, INVENTOR.

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PATTERNS,—
27 Geo. III., c. 38; 2 Victoria, c. 13; 2 Victoria, c. 17. (The last relates to patterns and *models*.)

PATENTS FOR INVENTIONS,—
2 and 3 Victoria, c. 67.

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38 Geo. III., c. 71.

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7 Geo. III., c. 38; 17 Geo. III., c. 57.

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A WEEKLY BRITISH AND FOREIGN MISCELLANY OF

SCIENCE, INVENTIONS, MANUFACTURES, & ARTS.

No. 66.] SATURDAY, OCTOBER 31, 1840. [PRICE FIVEPENCE STAMPED. CIRCULATING FREE BY POST.

ON THE CAUSE OF WINDS AND STORMS.

In our last number we endeavored to show that the usually-assigned cause of winds is altogether inadequate to accouut for the motion of the air near the earth's surface. We stated that the effect of the sun's heat on a large volume of air over sea or laud could not cause currents to rise from the lower atmosphere into the upper, because the heat imparted to the lower strata of air by the sun does not expand it in an equal degree to the diminished pressure on the strata above. The effect of the heat of the sun we stated to be the expansion merely of the air, and not a change of its relative position to the superincumbeut air. Having thus combated the notion on which Mr. Espy founds his theory, that the winds are caused by the heated air rising in the atmosphere, and the colder air above rushing in to supply its place, we undertook to explain our opinion of the causes which produce motion in the atmosphere. It is always more easy to attack the theories of others than to establish new ones in their place, nor do we conceive that to point out an error necessarily involves the duty of indicating the truth; we have, however, promised to substitute a theory for the one we have endeavored to overthrow, and we shall consequently advance it; not as affording an explanation of all the various phenomena of winds, but at least as assigning one probable cause for the motion of the atmosphere, more satisfactory than the existing theory.

Expansion and a vacuum are the opposites of each other; and it would in all ordinary cases be considered absurd to attribute the cause of a partial vacuum to existing expansion. It is, in short, the same as to say that the emptiness of a vessel is caused by its being over-filled. Yet this self-evident absurdity has been recognised as a reasonable explanation of the cause of winds. The expansion of the air it is said produces a partial vacuum by causing the heated air to ascend. This is the proposition against which we contend. The proposition we wish to substitute for it is, that the vacuum is produced by the subsequent *contraction of the air by cold;* or, more correctly speaking, by the diminution of temperature.

The effect of the sun's heat on the atmosphere over an even surface of land or water, is to increase its bulk. This increase of volume must find space to expand in. It cannot expand laterally, because, in the case we have assumed, the air is on every side equally dilated. The only direction then in which it can expand is upwards. It therefore swells out perpendicularly, aud raises the stratum of air above it still higher in the atmosphere. It cannot change its relative position with the upper stratum, as we showed by calculations last week respecting the relative densities of the upper and lower strata of the atmosphere; the heated air being still heavier than the air above, it forces that upwards by its expansion. The upper stratum thus elevated also acts in the same mauner on the portions of air still higher, and in this manner the whole volume of the atmosphere is expanded, and stands higher over the heated part of the globe than it does in the colder regions. That this must be the effect of heating any large volume of the atmosphere will be evident on a little consideration. If the elevated air were to spread itself out to a uniform distance from the earth with the other portions of the atmosphere—if it were "to find its level,"—the mass of the atmosphere above those portions of the globe where the air is heated would be lighter than in the northern and colder parts, and its pressure would be consequently less. Assuming the average difference between the temperature of England and that between the tropics to be 30 deg.; that higher degree of heat in the equatorial portion of the globe would diminish the weight of the whole volume of the atmosphere about one-fifteenth; the mercury in the barometer ought, therefore, according to that calculation, to be two inches lower within the tropics than it is in England, if the expanded air were equalised, instead of the atmosphere being raised. But so far from there being any diminution of pressure of the atmosphere within the tropics, the barometer stands generally higher than in this colder climate, aud indicates a pressure seldom varying from thirty inches of mercury. It not only, therefore, exceeds the average pressure of the atmosphere in England, but it maintains that pressure without fluctuation; whereas, if we supposed the upper strata of the atmosphere to be constantly "running over" and returning, the fluctuations would be constant and to a much greater amount.

Assuming therefore that this is the state of the atmosphere during a tropical day, let us next consider what must ensue when the cause of expansion is removed; that is, when the sun's rays are withdrawn during the night.

The lower stratum of air which was before expanded must then become compressed into a smaller space; the vapors contained in it must be condensed, and a partial vacuum produced. To restore the equilibrium the air would rush in laterally and from above, and occasion a current of wind towards the vacuum point. This vacuum space, towards which the air would be impelled, would follow at a long interval the track of the sun, instead of being under his direct rays, but it would still follow the sun's course from east to west; in the same manner as on the supposition that the partial vacuum is produced immediately by the expansion of the air.

The difference between the cause we assign for the regular winds, and the generally received theory, is this: We attribute to the contraction of the air by cold the effect which is generally ascribed to expansion of the air by heat. In the one case the accession of heat is supposed to produce a partial vacuum directly by making the air lighter, whilst in the other, the vacuum is attributed to the diminution of heat, which contracts the air, and condenses the vapor it before held in solution. Our theory has at least this advantage above the existing one, that it is founded on the well-known effect of diminished temperature on air; whilst the other has to contend against the equally-recognised fact, that increase of heat has a tendency to fill a vacuum instead of making one.

The theory we have proposed has reference, however, only to general cases. There are local circumstances which may completely alter the effects of the sun's heat on the atmosphere, and produce a variety of changes which it is next to impossible to calculate. In islands, and near the sea-shore, the great difference between the temperature of the air above the land and that above the sea, will produce a different action from the one we have indicated. In these cases the air above the sea, *on the same level* as the heated air over the land, will be heavier than the latter; and will force the lighter, heated air upwards. It is from this cause that those grateful sea breezes are produced in hot climates, which render places habitable that would otherwise be unendurable. Similar local circumstances,—the neighborhood of lakes, or large rivers, or high mountains,—may also

occasion changes in the equilibrium of the atmosphere, and produce currents of air depending solely on the different specific gravities of air on the same level, and subjected to the same pressure. In these cases there is no partial vacuum produced; but the lighter air is forced upwards by the heavier air, in the same manner as a similar quantity of hydrogen gas would rise in the atmosphere owing to its lesser specific gravity. It must be observed, however, that the distinction in these local circumstances between our theory and that on which Mr. Espy founds his theory of winds and storms, is, that we assert that the space occupied by the rising and lighter air is not occupied by the air above, but that the superincumbent air is forced upwards by heavier air on the same level, without any vacuum having been produced. We have shown in our last number that the effect of the sun's heat is never sufficient to diminish the specific gravity of the air near the surface of the earth to less than that of the air immediately above. It is therefore only when circumstances occur which give to one volume of air on the same level greater expansion than another volume of air near it, that any current can be produced by the effect of increased heat directly. These differing circumstances do not exist on the ocean, where the trade winds blow, and there it is that our theory more particularly applies.

We intended to have considered the causes of storms as well as of winds, but our present remarks have already extended beyond the usual limits.

THE IRON MANUFACTURES OF ENGLAND AND FRANCE.

The following notice of the iron manufactures of England and France is by M. Michel Chevalier. It forms the introduction to a review of a work recently published in Paris, on practical metallurgy.

It has been justly observed that the degree of civilisation attained by any nation may be ascertained by the quantity of iron it consumes. If this is the case, France, since the year 1830, must have made very considerable progress in civilisation, for since that time her consumption of forged iron, which remained nearly stationary at 150,000 tons (of 1,000 kil.,) has continued regularly to increase. In 1838 there were 224,000 tons of forged iron manufactured. The production of cast iron was 348,000 tons, reckoning that which is employed as cast iron, and that which is refined, that is, converted into malleable iron, which during this change is subject to very considerable waste.

It is difficult to anticipate any limits to this progress. Iron, in proportion as man becomes better acquainted with the method of working it, is appropriated to other purposes, and replaces other materials, that are become more scarce, such as wood. In our time it is adopted as a material for building both houses and ships.

Malleable iron was formerly extracted directly from the ore. During the last six or seven centuries it has undergone an intermediate process. Cast iron, which, as the name indicates, is fusible, is consequently adapted to many purposes that iron, commonly so called, would not admit of. Cast iron when it is intended to be converted into forged iron goes through the operation of being refined. Till the commencement of this century cast iron was refined in small furnaces called refining furnaces, of which a blacksmith's forge is a good representation on a small scale.

Necessity is a powerful instructress. It is she who induced the English to substitute coal for charcoal. About a century ago their forests were exhausted. Meanwhile the progress of their manufactures imperiously urged them to continue making iron, which supplies other branches of production with the first materials for their tools and machines. This was about the year 1740. Resuming the experiments attempted by Lord Dudley at the beginning of the 17th century, the masters of the English forges projected using in their blast furnaces the coal furnished by the inexhaustible mines of their country, after submitting it to a process which converted it into coke. More recently coal has been used in the same way for refining cast iron, without being made into coke. The ordinary charcoal fire which was confined in a square hearth, and excited by a powerful blast of air from a pair of bellows, was replaced by a reverberating furnace, in which the coal was placed on a grate, and the blast produced by the draught of a high chimney. The process of refining was then called puddling.

The ingenuity of the English does not stop here. In order to form the tempered iron into regular bars, they gave up the use of small hammers, and substituted cylinders put into rapid motion, which seized between their revolving surfaces the masses of red hot iron, squeezing them like soft wax; and flattening and shaping them in the course of a few minutes into bars of all sizes. By means of these improvements the manufacture of iron in Great Britain has been and will continue to be an inconceivable resource of national wealth. In 1740 all the English blast-furnaces together only produced 17,000 tons of cast iron.

In 1788 the production was	68,000	tons.
1796	125,000	
1806	230,000	
1820	400,000	
1828	700,000	
At the present time it is....	1,000,000	

At the same time, thanks to the general progress of British industry, and particularly to the orders for rails for the railroads in England and America, the manufacture of iron has been of late years extraordinarily rapid; it will continue to make further improvements. The principal of which will be, firstly, to employ a blast of hot air instead of cold in the blast furnaces; secondly, in certain cases to employ coal as it comes from the pits, without being converted into coke, and to render available the calorific power of the gas which escapes during the carbonisation. Thirdly, to employ in blast furnaces a kind of coal not hitherto used for this purpose. This coal is called anthracite. It was unsuccessfully attempted to be employed in the manufacture of iron a dozen years ago. For this last improvement, iron-foundries are indebted to Mr. Crane.

The English manufacture became generally adopted by us after many attempts and many failures, after the ruin of numerous speculators, who, one after another, threw their capital into the crucible of their blast-furnaces, as into a fathomless gulf.

France at length possesses immense establishments like those of England; at the head of which we may mention Decazeville, which has at last completed its long and persevering experiments; Alais and Creuzot, which have been saved from ruin by experienced hands; and above all, Fourchambault, which escaped the ruin to which other similar establishments were a prey, owing to the ability of the late M. Louis Boignis.

The English system when first introduced into France was received with a kind of enthusiasm. It appeared as though the only chance of succeeding in the manufacture of iron was to rush blindly into the method adopted in Great Britain.

It was determined at all risks that coal should be used in the manufacture. Wood was considered unworthy to be put into competition with it. In the course of time they began to understand that France was less richly gifted with coal mines than England, that if the English had ceased to employ wood it was because their forests had been exhausted in clearing the ground, while the French soil is intersected by chains of mountains where nothing but wood will grow. It was said that after all, forests had the advantage of being more inexhaustible than mines; that our iron ores are superior to those of England; that they were much cheaper; and that, consequently, our iron-works would be enabled to bear an extra expense in the fuel employed, wood being necessarily more expensive than coal, which is found in thick beds under our feet. Viewing the subject in this light, the iron-masters of France who use wood, secure with respect to the future, have shaken off their apathy, and have set out on a plan of their own in pursuit of improvement. Reserving charcoal for smelting the iron; they have done the refining part with coal, by means of the English operation of puddling in a reverberating furnace; but in order to form the iron into bars, they make use of their old plan of hammering, instead of resorting to cylinders, which would have been very expensive. They afterwards endeavored by additional contrivances to make use of all the caloric which is given out by the combustion of the wood.

During the process of carbonisation, wood loses at least four-fifths of its weight. Thus, of 100 parts, 80 of them are wasted without any advantage before the fuel is ready for the furnace. It has then been asked if it would be impossible to make use of those combustible elements which are entirely wasted. There has been an attempt made to fill the blast-furnaces with green wood, then with dry wood, and at last with charred or half carbonised wood, called red charcoal. A considerable number of the masters of forges have distinguished themselves by these attempts.

This is not all: once in pursuit of economy they imagined they might be able to turn to advantage the flame which issues from the chimneys of the blast-furnaces, and this they have appropriated to two purposes, the one to heat the air which is afterwards used for the blast of the furnaces; the other, still more important, to give motion to the machinery of the forges, that is, the blowing machines and the hammers. Heat, in fact, since the invention of steam-engines, is nothing but power. Considering as such their success has been complete.

At the last exhibition of the products of industry, Messrs. Thomas, Laurens, and Dufournel, and also M. Eugene Flachat, obtained a silver medal for having fitted up in a great many manufactories an apparatus, by means of which the flame which escapes from the blast-furnaces, from refining furnaces and reverberatory furnaces, is applied as a means of working the bellows, rollers, and the hammers.

In this double innovation, of the substitution of wood for charcoal, and in the appropriation of the heat that escapes, there is the germ of a revolution in metallurgy. It enables France to obtain more iron with the same quantity of wood, and it even changes the condition of the nature of forges by affording the means of building them at a distance from streams of water, which hitherto had been necessary, in order to obtain the moving power requisite for the different operations.

MANUFACTURES IN BOHEMIA.

With the exception perhaps of Moravia, Bohemia has long been the most celebrated of all the Austrian states for its manufactures. At this moment it produces the finest linens and linen yarns of any country in Europe. Spinning is the universal and favorite employment of the women; and no fewer than 500,000 females are said to prosecute it as a subsidiary business! Machines for spinning have, however, been introduced; but it remains to be seen whether they will be able to undersell the yarn produced by the hand. About 55,000 hands are supposed to be employed in linen weaving; and the total annual value of the produce of this branch of industry, including that of lace, may be estimated at about 1,200,000*l.* a year. This branch of industry is said, however, to be on the decline, in consequence of the growth of the cotton manufacture. According to the National Encyclopædia, 20,000 individuals are employed in hand-

spinning, exclusive of those employed in the factories, which are numerous; 18,000 hands are said to be employed in the hosiery department of the trade. There are about 500 bleaching establishments in full work, and the manufacture of potash is considerable. The woollen manufacture is very extensive; in spinning only, 55,000 hands are said to be engaged; and in weaving, from 15,000 to 16,000; the weaving of woollen stockings employs from 2,000 to 3,000 hands. The hat-makers, furriers, &c., are estimated at 1,200; and the leather manufacturers at 4,000. There are about 100 paper-mills; and the imperial tobacco manufactory at Seidlitz supplies the whole country with that article, through the agency of above 7,000 retail shops. But of all the Bohemian manufactures, none is nearly so well known in foreign countries as that of glass. Bohemian glass is not so pure as that of England or France; but the art of staining, painting, and gilding glass, is much better understood there than in this country, and articles of Bohemian manufacture are unequalled in point of lightness and richness of appearance. It is probable, however, were it not for the weight of the duties laid on glass in this country, and the troublesome regulations connected with their assessment, that we should soon become formidable rivals of the Bohemians, even in those departments in which they appear at present to have the greatest superiority. Altogether, it is said that from 1-5th to 1-4th part of the inhabitants of Bohemia are engaged in manufactures. But then it is material to observe, that all the hand-spinners and weavers combine with their business that of cultivators of patches of land, and other employments. We believe, too, that the cotton trade of Bohemia, like that of the rest of Austria, is entirely the creation of prohibitions and oppressive duties on foreign stuffs and yarn; and that, were these repealed, or materially modified, the manufacture would be involved in the greatest difficulties. Owing to the want of capital, many of the great landed proprietors are obliged to engage in manufactures. Thus, Prince Kinsky, and Counts Harrach and Bucquoy, are the greatest glass manufacturers; Prince Auersberg manufactures sulphur, vitriol, and colors; Count Urbna and Prince Windizhgratz, tin plates; Count Thun, porcelain; Prince Lobkowitz, earthenware; Prince Walleustein and others, beet-root sugar, &c. It is clear that manufactures carried on under such auspices must be more expensive and less improved than if they were carried on by individuals dependent upon them.—*M'Culloch's Geographical Dictionary.*

TRADE IN CHINA.

All the legitimate trade of China with European nations (Russia excepted) is conducted at Canton. The Russians are the only nation not permitted to have a resident or factory here; the commerce between the two empires, which is very extensive, centres at Kiachta, on the border of the empire, in Mongolia. The policy which has determined this regulation, as well as that which has fixed the only foreign mercantile port at almost the greatest possible distance from the capital, is probably dictated not only by a jealous fear of strangers passing the boundaries of the empire, but also from a desire, on the part of the government, to obtain the greatest amount of transit duties. The European trade, now so immense, originated in a commercial treaty between Emmanuel, King of Portugal, and the Emperor of China, in 1517. In 1634, some British ships first touched at Canton. In 1680, the direct trade of the East India Company with China commenced. In consequence of the extraordinary increase in the demand for tea, which, from being a luxury seldom seen, so late as the reign of Queen Anne, even in the houses of the nobility, has become a necessary of life, used by the poorest classes, the British trade with Canton has progressively and rapidly increased since 1700; and the great mass of the foreign commerce (which, inclusive of that of the junks, is estimated at 80,000,000 dollars yearly) is carried on by the English and Americans. Until the expiration of their charter, in 1834, the British trade was entirely in the hands of the East India Company; and during the last three or four years of their monopoly, that body imported tea (which has always been the principal export from China) into England to the amount of 31,500,000 lbs. annually. After the expiration of their charter, the quantity imported was still greater. In 1834, no less than 150 British vessels, with a united tonnage of 82,470 tons, resorted to Whampoa, near Canton, and brought away 43,641,200 lbs. of tea. The import of that article subsequently diminished, but it is still greater than at any period during the Company's monopoly. In the season from Oct. 1, 1836, to April 10, 1837, the British traders took away 33,211,332 lbs. of tea, in proportion of one part green to three-and-a-half black. The total value of tea exported that year was 20,255,065 dollars. Next to tea, raw silk and silk piece-goods are the principal articles of export; their aggregate value having amounted in 1837 to above 10,000,000 dollars; then follow treasure, sugar, and a host of inferior articles. The trade between British India and China has been greater in amount and importance than that between China and England. The principal export from India was formerly raw cotton, chiefly from Bombay; but opium has long exceeded that article in importance, having latterly been clandestinely imported into China to so vast an amount, that its value has rather exceeded that of the tea exported. Very recently, however, the Chinese government have, in appearance at least, set vigorously to work to suppress the trade in opium, and to exclude it from the empire. But those best acquainted with China believe that the taste for the drug is too firmly rooted among the population to admit of the government succeeding. The probability, however, seems to be, that the events that have occurred, particularly the confiscation of the opium belonging to British merchants, will lead to very material changes in the trade, and, perhaps, too, in our relations with China. A fleet of fifty or sixty vessels, of 300 or 400 tons burden, are annually despatched to Canton from the United States, and the whole of the American trade is valued at about 10,000,000 dollars. About the same number of pounds of tea are annually imported into America. The Dutch usually send sixteen or seventeen vessels during the season; but many come from Batavia; and the import direct of tea from Canton into Holland, is not more than 3,000,000 lbs. a year. About three or four French ships annually have appeared of late years at Whampoa; the trade of Spain, Sweden, Denmark, and Austria, with Canton, is very small.—*M'Culloch's Geographical Dictionary.*

MONTHLY LIST OF NEW PATENTS.

William Henry Fox Talbot, of Lacock Abbey, Wilts, Esq., for *improvements in producing or obtaining motive power.*—6 months, Oct. 1.

William Horsfall, of Manchester, card-maker, for *an improvement or improvements in cards for carding cotton, wool, silk, flax, and other fibrous substances.*—6 months, Oct. 1.

James Stirling, of Dundee, engineer, and Robert Stirling, of Galsten, Ayrshire, doctor in divinity, for *certain improvements in air-engines.*—6 months, Oct. 1.

George Ritchie, of Gracechurch-street, and Edward Bowra, of the same place, manufacturers, for *improvements in the manufacture of boas, muffs, cuffs, flounces, and tippets.*—6 months, Oct. 1.

James Fitt, senior, of Wilmer-gardens, Hoxton-old-town, manufacturer, for *a novel construction of machinery for communicating mechanical power.*—6 months, Oct. 7.

John Davies, of Manchester, civil engineer, for *certain improvements in machinery or apparatus for weaving.*—6 months, being a communication, Oct. 7.

Thomas Spencer, of Liverpool, carver and gilder, and John Wilson, of the same place, lecturer on chemistry, for *certain improvements in the process of engraving on metals by means of voltaic electricity.*—6 months, Oct. 7.

Thomas Wood, the younger, of Wandsworth-road, Clapham, gent., for *improvements in paving streets, roads, bridges, squares, paths, and such like ways.*—6 months, Oct. 7.

Charles Payne, of South Lambeth, Surry, gent., for *improvements in salting animal matters.*—6 mths., Oct. 13.

Robert Pettit, of Woodhouse-place, Stepney-green, gent., for *improvements in railroads, and in the carriages and wheels employed thereon.*—6 mths., Oct. 15.

Henry George Francis Earl of Ducie, of Woodchester-park, Gloucester, and Richard Clyburn, of Uley, engineer, and Edward Budding, of Durseley, engineer, for *certain improvements in machinery for cutting vegetable and other substances.*—6 months, Oct. 15.

William Newton, of Chancery-lane, civil engineer, for *an invention of certain improvements in engines to be worked by air, or other gases.*—6 months, being a communication, Oct. 15.

James Hancock, of Sidney-square, Mile-end, civil engineer, for *an improved method of raising water and other fluids.*—6 months, Oct. 15.

Henry Pinkus, of Panton-square, Middlesex, Esq., for *an improved method of combining and applying materials applicable to the formation or construction of roads or ways.*—6 months, Oct. 15.

Charles Parker, of Darlington, Durham, flax-spinner, for *improvements in looms for weaving linen and other fabrics, to be worked by hand, steam, water, or any other motive power.*—6 months, Oct. 22.

Richard Edmunds, of Banbury, Oxford, gent., for *certain improvements in machines or apparatus for preparing and drilling land, and for depositing seeds or manure therein.*—6 months, Oct. 22.

Thomas Clark, of Wolverhampton, iron-founder, for *certain improvements in the construction of locks, latches, and such like fastenings, applicable for securing doors, gates, windows, shutters, and such like purposes.*—6 months, being a communication, Oct. 22.

Gabriel Riddle, of Paternoster-row, stationer, and Thomas Piper, of Bishopsgate-street, builder, an extension of an invention for the term of 7 years, for *a certain improvement or improvements on wheels for carriages*, which said patent was originally granted to Theodore Jones, of Coleman-street, accountant, and by him assigned to the above-named parties.—Oct. 22.

ENGLISH EXPIRED PATENTS.

Not a single patent has expired during this week.

SPECIFICATIONS.

ENTERED AT THE ENROLLMENT OFFICE.

(*Continued from page* 260.)

Francis Molineaux, Walbrook-buildings, London, gent., *improvements in the manufacture of candles, and in the manner of consuming tallow, and other substances, for the purposes of light*, Oct. 23.—Claim first.—Mode of applying cylinders, or blocks of tallow, or other suitable substances, which are formed without wicks, for the purpose of being consumed in lamps.

These cylinders or blocks of tallow are made of any proper diameter, according to the size of the tube contained in the pillar of the lamp, in the foot of which there is a spiral spring for the purpose of pressing the blocks towards the top, where there is a socket furnished with slits for the admission of air, and so constructed as to screw up or down, that the wicks contained therein may be placed nearer to or further from the tallow; this socket is furnished with brackets, at the ends of which are upright hooks or points, for holding the wicks; they also

form holdera and supports for the glasa chimney. The wicks are formed of muslin rolled round a wooden mandril, so as to form a tube, and then filled with cotton dipped in melted tallow; they are then cut into lengths of about half an inch, and placed one on each hook of the socket, and the tallow will be supplied by the spring pressing the blocks upwards, and the lamp will burn for eight hours without requiring snuffing.

Claim second.—Mode of applying air to carriage lamps.

This is effected by simply having the sockets of the lamps supported by a series of tubes which pass through the bottom of the lamp, and thereby admit the atmospheric air to the flame.

ELIJAH GALLOWAY, Manchester-street, Gray's Inn Road, engineer, *improvements in steam-engines, which improvements are also applicable to engines for raising and forcing fluids*, Oct. 22.—This specification is too complicated to give a clear description of these improvements without the aid of drawings, we shall therefore simply give the claims, with a short description of some of the working parts.

Claim first.—Mode of constructing the working parts of rotary engines, that they may be kept steam-tight by pressure.

Claim second.—The form, construction, and method of suspending the abutment cylinder that it may revolve with the piston, and be kept in contact with the other cylinders by its own gravity.

Claim third.—The construction of the piston.

Claim fourth.—The steam-tight casing with its covers.

Claim fifth.—The construction of the interior ends of the cylinders.

These improvements are confined to rotary engines, and the one described in this specification may be termed a double engine. There is a steam-tight casing which is fixed firmly to frame-work, and through which there is an aperture for the main axle. Two cylinders, a large and a smaller one, are firmly screwed together by means of flanges, and the inner one keyed on one end of the shaft. The piston is formed with projections or ribs on its side, and fits accurately, and is fixed firmly between the two cylinders, so as to form a partition, the ends of these cylinders being turned out to quite a flat surface. On the other end of the shaft is a precisely similar arrangement of cylinders with a piston, only instead of their being keyed to the shaft, they are fixed thereto by feathers, which allow them as they rotate with the shaft alternately to approach and recede from the middle; in connection with these two sets of cylinders, and acting on both, is the abutment cylinder; this is cast in one piece, and has the form of a double cylinder open at both ends, and joined in the middle, where there are two flat surfaces with slits in the centre, made to prevent any friction on the main ahaft in its working; during which it is acted upon by pressure from two rollers placed at the side of the casing for that purpose; by these rollers, and with its own gravity, it is kept with its exterior cylindrical surface in contact with the interior aurface of the larger cylinders, and with its interior cylindrical surface in contact with the top part of the outer cylindrical surface of the smaller cylinders. The steam is conveyed from the interior to a condenser, or into the air (as the engine may be working), by a pipe, and it is by immersing this pipe in the water or fluid to be raised that that object is effected by this apparatus. The inventor lays no claim to any of the separate parts of the machinery, but to the combination as producing these effects; and observes that the greatest nicety is required in the manufacture of the working parts to render them steam-tight without using packing material of any kind, when by these improvements they will continue so, being by their arrangement entirely unaffected by the unavoidable wear and tear to which engines are subjected.

JAMES MALCOLM RYMER, of Burton-street, Burton-crescent, civil engineer, *improvements in castors for furniture, which may be applied to other purposes*, Oct. .—The claim is for a cut, engraved, or spherical surface, held by and partly contained in a metal cup of any appropriate size or form, and applied to furniture and other purposes.

A cup is formed of two pieces of metal, which screw together, in the inside at the top is fixed an inclined or conical piece of case-hardened iron, or other suitable material; the revolving part is a perfect ball of metal, the surface of which is cut or engraved all over to any pattern; it is then inserted in the cup, which is screwed together, and on being applied to any purpose for which castors are used, will revolve easily by the degree of friction being lessened against the conical metal surface, and increased against the floor or other surface on which it runs, by the means of the cut or engraved surface of the sphere.

ENTERED AT THE ROLLS CHAPEL OFFICE.

(Continued from page 261.)

JOHN WHITE, of Manchester, county of Lancaster, engineer, *improvement in vices*, Oct. 21.—These improvements consist in a novel construction of portable vices, with jawa capable of expanding much wider, and in a much greater degree of parallellism than those in common use; by being formed upon the upper ends of long levers or arms, having their fulcrums near to or on the floor of a platform, and so conatructed that the vice may be taken to the work, instead of the work to the vice, and without requiring any fixing, their own weight being quite sufficient in all cases to keep them perfectly steady. They are also provided with a table for holding files, hammera, and other toola close to the hands of the workman. Another modification of these improvements is, that one jaw may be made to open horizontally, whilst the other is stationary. A third modification is, that the holding jaws are allowed to awivel or turn, in order to hold any work that has not square or parallel sides, but is of a regular bevelled form, or any irregular ahape.

A pair of holding jaws are formed upon the upper ends of levers or arms, which are mounted upon fulcrum pins at their other ends, and supported upon a bed plate or platform. Each of the jaws contains a box for the vice screw to bear in; these are constructed so as to preserve a perfectly parallel position of the screw in whatever position the jaws may be. The opening of the vice is assisted by a plate with sliding guide rods, and is placed so as to form a table or bench for the workman. Another mode is by having the holding jaw fixed, and the moving one vibrating on a fulcrum pin in the bed plate or table, which is morticed so as to receive the tools that are not in use. The method of constructing vices that the jaws may swivel upon a centre, is, by mounting the jaws on their fulcrums in bed plates or frames, which are allowed to turn or swivel upon a common centre pin; the morticed table being furnished with a descending weight, which, as the screw ia turned for opening the jaws, causes friction rollers on the side of the table to act against inclined planes, and turn the nuts or boxes of the screw spherically.

The claim is for the construction of portable vices that may be carried to the work, and having the range of the opening jaws of greater extent, and more parallel, owing to their length, without being confined to shape or dimensions.

NOTICE.

In accordance with the determination expressed in our 26th Number, of giving one month's clear notice to Inventors, before publishing their specifications, we hereby inform the following Patentees, that their specifications will be published in the "INVENTORS' ADVOCATE" of Dec. 12. Each party will receive, in addition, a *private* communication to the same effect.

James Allison, of Monkwearmouth, Durham, ironmaster, and Roger Lumsden, of the same place, due Nov. 30.
John Baptist Wicks, of Leicester, due Nov. 30.
John Hawley, of Frith-street, Soho, due Dec. 1.
Pierre Defaure de Montmerail, of London-wall, due Dec. 2.
Richard Trien Martin, of Derby, due Dec. 2.
Samuel Salisbury Eagles, of Liverpool, due Dec. 2.
James Harvey, of Basing-place, Waterloo-road, due Dec. 2.
William Southwood Stocker, of Birmingham, due Dec. 2.
Christopher Dain, of Edgbaston, Warwick, due Dec. 2.
James Roberts, of Sheffield, due Dec. 3.

PATENTS NOT SPECIFIED.

PATENTS THAT HAVE NOT BEEN SPECIFIED WHEN THEY BECAME DUE, SINCE THE COMMENCEMENT OF THE "INVENTORS' ADVOCATE," AUG. 17, 1839.
(*The money lost on each is at least* £110.)

THOMAS ROBINSON, of Wilmington-square, for *improvements in the process of rectifying or preparing spirituous liquors, in the making of brandy*,—due Aug. 7, 1839.

JOHN THOMAS BETTS, of Smithfield-bars, rectifier, for *improvements in the process of preparing spirituous liquors in the making of brandy*,—due Aug. 11.

AUGUSTE V. I. BARON D'ASDA, of Millman-street, Bedford-row, for *improvements in producing or affording light, which he denominates a solar light*,—due Sept. 6.

GEORGE H. PALMER, of Surrey-square, Old Kent-road, C. E., and GEORGE B. PATERSON, of Hoxton, engineer, for *certain improvements in gosmeters*,—due Sept. 6.

HENRY DUNNINGTON, Nottingham, lace manufacturer, for *improvements in machinery employed ip making framework knitting or stocking fabrics*,—due Sept. 16.

JOHN BOYD, of College-street, and HUGH F. RENNIE, of Glengall-street, Belfast, flax-spinners, for *certain improvements in the spinning-frame, used for spinning flax, hemp, and tow, upon the wet principle*,—due Sept. 30.

JAMES F. SAUNDERS, New Bond-street, for *improvements in the manufacture of certain descriptions of paper, millboard, papier maché, and other matters of that kind, capable of being produced from such description of paper pulp*,—due Sept. 20.

WILLIAM CROFTS, of Radford, lace manufacturer, for *improvements in machinery used in making bobbin-net lace, for the purpose of making figured or ornamental bobbin-net lace, and lace or net of various textures*,—due Sept. 20.

RICHARD PROSSER, of Birmingham, civil engineer, for *certain improvements in machinery for making nails and screws*,—due Nov. 8.

ALEXANDER GORDON, of Fludyer-street, Westminster, engineer, for *an improved machine or apparatus for employing steam or other elastic fluids as a motive power*,—due Nov. 30.

DAVID NAYLOR, of Copley Mill, Halifax, manufacturer, and JOHN CRIGHTON, jun., of Manchester, machine-maker, for *certain improvements in machinery for weaving single, double, or treble cloths, by hand or power*,—due Nov. 7.

EDWARD LOOS, of Air-street, Piccadilly, chemist, for *improvements in extracting the saccharine matters from sugar canes and other substances of a saccharine nature, which improvements are also applicable in extracting coloring matters from wood and other matters used in dyeing*,—due Dec. 17.

JAMES BINGHAM, of Sheffield, manufacturer, and JOHN A. BODEN, of the same place, for *certain improved compositions, which are made to resemble ivory, bone, horn, mother-of-pearl, and other substances, applicable to the manufacture of handles of knives and razors, pianoforte keys, snuff-boxes, and various other articles*,—due Dec. 26.

JOHN WERTHEIMER, of West-street, Finsbury Circus, for *certain improvements in preserving animal and vegetable substances and liquids*,—due Dec. 20.

(*To be concluded next week.*)

COPYRIGHTS OF DESIGNS.

The following is a List of the Designs which have been Registered under the recent Act of Parliament, for giving Protection to Designs, from the commencement in August, 1839, to the 6th January, 1840. We shall continue the list up to the latest period in our succeeding number, and publish it in future as the designs are registered:—

NO. OF DESIGN.	DATE OF DEPOSIT.	NAME OF PROPRIETOR.	SUBJECT OF DESIGN.	DURATION OF COPYRIGHT.
	1839.			
1	12th August	H. Hooper	Letter Balance	3 years.
2	19	J. H. Poole	Stove	3 „
3 to 6	19	Henry Longden and Son	Stove	3 „
7	27	J. Barlow	Cork Pressing Machine	3 „
8	2d Sept.	J. and J. Walker	Diagonal Cords	1 „
9	3	Thos. Messenger and Son	Branch Candlestick	3 „
10	6	S. Ackroyd	Stove	3 „
11	6	Ditto	Fender	3 „
12	16	Ditto	Fender	3 „
13	16	Ditto	Stove	3 „
14	16	Nicholson and Hoole	Fender	3 „
15 to 16	16	Ditto	Stove	3 „
17	20	J. E. Hucksley	Stove	3 „
18	27	Jno. Gray	Barrel Organ	3 „
19 to 20	2d October	Whitfield and Hughes	Chandelier	3 „
21 to 22	2	Ditto	Lamp	3 „
23	4	C. Bradbury	Embossed Paper	1 „
24	8	T. Bangs	Gas Burner	3 „
25	8	J. and J. Walker	Diagonal Cords	1 „
26 to 51	14	Wilcoxson and Sons	Stained Paper	1 „
52 to 54	15	J. and J. Walker	Gambroon	1 „
55 to 57	16	ditto	Cantoon	1 „
58	18	W. Greaves and Sons	Table Knife	3 „
59	21	J. Hands	Coffin Lace	3 „
60	21	Ditto	Breast Plate for Coffins	3 „
61	23	A. Solomon and Son	Embossed Cloth	1 „
62	29	Carron Company	Box Scraper	3 „
63 to 65	29	G. Morgan	Glass Ornaments	1 „
66 to 67	31	J. Yates	Stove	3 „
68	31	Hy. Hooper	Letter Balance	3 „
69	5th Nov.	Sam. Jones	Light Extinguisher	3 „
70	5	*Cancelled*		
71	5	Kennard, Staite, and Co.	Tomb Railing, or Balcony Panels	3 „
72	14	Sam. Dobson and Sons	Carpet Bag Pattern	1 „
73	15	Thos. De la Rue, and Co.	Embossed Paper	1 „
74	15	Wm. Jenkins	Improved Damper Action for Upright Pianofortes	1 „
75 to 105	18	Williams, Coopers, Boyle, and Co.	Stained Paper	1 „
106	19	Jno. Ridgway	China Plate	1 „
107	22	Thos. Burn Willoughby	Billiard Table	3 „
108	22	Wm. Evans	Stained Paper	1 „
109	25	E. B. Denison	Letter Weight	3 „
110	25	Chas. H. Denton	Stained Paper	1 „
111	25	Jno. G. H. Ronketti	Barometer	3 „
112	26	Thos. Bangs	Gas Burner	3 „
113	28	Gabriel Riddle	Letter Weight	3 „
114 to 115	28	Thos. Horne	Cornice Pole	3 „
116	2d Dec.	Henry Chany	Scale	3 „
117 to 118	3	William Evans	Stained Paper	1 „
119	4	Thos. Horne	Cornice Pole or Curtain Ring, &c.	3 „
120	5	William Lund	Weighing Machine	3 „
121	6	Gabriel Riddle	Letter Weight	3 „
122	6	William Lund	Letter Weight	3 „
123	9	Ibotson and Jno. Walker	Cantoon	1 „
124	10	Gabriel Riddle	Letter Weight	3 „
125	12	Abraham F. Osler	Letter Weight	3 „
126	16	Williams, Coopers, Boyle, and Co.	Stained Paper	1 „
127	16	William Lund	Letter Weight	3 „
128	19	Geo. R. Metzler	Pianoforte Damper	1 „
129	20	Jno. E. Huxley	Stove	3 „
130	20	Henry B. Wright	Letter Weight	3 „
131	23	Ibotson and Jno. Walker	Cantoon	1 „
132 to 147	23	William Evans	Stained Paper	1 „
148	23	Joseph Ashton	Conducting and consuming Gas, Smoke, &c.	3 „
149	24	Thos. Messenger and Sons	Lamp	3 „
150	27	Tom Skelton	Beibazar Fleece	1 „
151	27	Davis, Brothers	Telescope	3 „
152	27	Joseph Gillott and Thos. Walker	Letter Weight	3 „
153	30	Robert Rettie	Letter Weight.	3 „
154	31	Heeles, Gawthorpe, and Co.	Ribbon	1 „
155	31	Wm. A. Robertson	Roller Calendar	3 „
	1840			
156	2d January	Cope and Austin	Table Fastening	3 „
157	3	Wood and Ogilvy	Carpet	1 „
158	6	Joseph Ashton	Gun Lock	3 „

FOREIGN INTELLIGENCE.

BELGIUM.

The Parliamentary Commission of Inquiry into the State of Trade and Manufactures, recently held a long sitting at Ghent, at which a great number of merchants and manufacturers were present. Some interesting discussions took place relative to the means to be adopted for removing the present depressed condition of trade and manufactures in Belgium. The labors of the commission are now approaching their termination. The report of the commissioners is represented to be in progress, and it will necessarily be very long, as it will have to contain an account of the numerous contradictory opinions gathered at the different manufacturing and commercial towns. The Belgian commissioners do not manage their official business so secretly as the commissioners in this country; for we understand that several portions of their report have been already shown to various commercial men for their perusal. The opinions they entertain of it are represented to be very favorable;—that it leaves, in short, nothing to be desired either in regard to its clearness and precision, or as to the correctness with which all the opinions collected in the course of their tour through the country are set forth.

The Committee of the Association for the encouragement of the linen manufactures, have instituted prizes for improvements and perfection in the manufacture. These prizes will be distributed at Ghent, on the 11th of next December.

The *Journal de Bruges* states that great exertions are making to suppress the University of Ghent. The town will receive ample compensation for this loss by the projected enlargement of the school of industry, which will become one of the greatest establishments of the kind.

The *Gazette d'Ausbourg* announces that King Leopold has subscribed for 10 shares of a literary society, established at Stuttgard, for the publication of interesting manuscripts, and the reprinting of old works of which a few copies only remain.

On Tuesday week, a treaty was concluded at Antwerp by the members of the Dutch and Belgium Commission for the regulation of the pilotage in the Scheldt, in execution of the treaty of the 19th of April, 1839. The treaty consists of about 80 articles. It is said that Belgium may congratulate itself on the manner in which the negotiations have been conducted, and the result to which they have led. The treaty has now to be laid before the two Governments for their ratification.

FOREIGN PATENTS.—BELGIUM.

LIST OF PATENTS RECENTLY GRANTED BY THE BELGIAN GOVERNMENT.

(*Continued from No.* 59.)

C. E. Dampier, of London, represented at Brussels by Delianson Clark, Marché-aux-Poulets, No. 1, a patent of invention for 15 years, for *an improved balance of new construction*, Aug. 27, 1840.

P. J. Bezis, of Liege, rue de la Madeleine, No. 105, a patent of invention for 10 years, for *a brick-making machine*, Aug. 27, 1840.

A. Le Cat, of Brussels, Montagne des Aveugles, No. 5, a patent of invention for 10 years, for *a mode of making trousers without buttons*, Aug. 27, 1840.

C. DeChangy, of Brussels, rue du Jardin d'Idalie, No. 617, a patent of invention for 15 years, for *a machine for printing canvass for oil painting*, Aug. 27, 1840.

A. Voss, of Brussels, rue des Minimes, No. 7, a patent of addition for 15 years, to date from July 17, 1840, for *a process of manufacturing soap*, Aug. 27, 1840.

Jean Peeters, of Molenbeck St. Jean, rue du Billard, No. 11, a patent of improvement for 10 years, to date from June 30, 1840, for *improvements in self-igniting cigars*, Aug. 27, 1840.

H. Janssens, of Amsterdam, address at Brussels, rue Montagne-aux-herbes-potagères, No. 25, a patent of invention for 5 years, for *a process of deadening the noise of carriages*, Aug. 31, 1840.

L. F. Fourcel and P. H. Gadon, of Brussels, rue de la Paille, No. 20, a patent of invention for 15 years, for *an improved filter by ascension*, Aug. 31, 1840.

Pottier, of Liege, rue Faubourg-Vivegnies, No. 270, a patent of addition for 5 years, to date from March 2, 1840, for *fire-arms loaded at the breech*, Aug. 31, 1840.

Auguste Lecointe, and N. Portalis, of Brussels, rue des Fabriques, No. 22, a patent of addition for 15 years, to date from Aug. 2, 1838, for *addition to the process of preparing and manufacturing tobacco*, Aug. 31, 1840.

D. E. Coutaret, and D. A. Roumestant, of Brussels, rue des Douze-Apôtres, No. 16, a patent of invention for 15 years, for *processes of obtaining from the waste products of coal a purified illuminating gas*, Sept. 1, 1840.

D. E. Coutaret, and D. A. Roumestant, of Brussels, rue des Douze-Apôtres, No. 16, a patent of invention for 15 years, for *a new plan of purifying animal oils, so as to render them fit for illuminating purposes*, Sept. 1, 1840.

François Kreps, of Louvain, rue de Malines, No. 21, a patent of invention for 10 years, for *a new blacking*, Sept. 1, 1840.

J. Stuttmaan, of Duron, represented by Velings, of Châtelet, a patent of invention for 15 years, for *a process of making wire-rope with a strand of tarred hemp*, June 6, 1840.

Wilson, of London, represented by Dixon, of Brussels, Hôtel de Groenendael, a patent of invention for 10 years, for *a new paper-cutting machine*, Sept. 15, 1840.

J. S. Guillemin, of Gilly, province of Hainault, a patent of invention for 10 years, for *flat metallic chains to be used instead of ropes or chains in working mines, &c.*, Sept. 15, 1840.

P. L. Detry, of Brussels, rue de la Paille, No. 6, a patent of invention for 10 years, for *a shoe without seam to the sole*, Sept. 15, 1840.

Auguste Delvigne, of Brussels, rue des Capucins, No. 37 bis, a patent of invention for 10 years, for *a machine for cutting files*, Sept. 15, 1840.

Augustin Guillaume, of Yve-Gomezée, province of Namur, a patent of invention for 15 years, for *a new and economical process of fining cast-iron, and converting it into wrought, rolled, or cast-iron*, Sept. 15, 1840.

H. F. Delvaux-Becquet, of Brussels, Montagne aux-herbes-potagères, No. 23, a patent of improvement for 5 years, to date from April 5, 1840, for *improvements in apparatus for preventing chimneys from smoking*, Sept. 15, 1840.

J. Kessel, of Brussels, rue du Bord-du-Verre, No. 12, a patent of improvement for 10 years, to date from June 6, 1840, for *an improved machine for grinding malt and crushing grain for brewing and distilling*, Sept. 15, 1840.

Leopold de Dorlodot, of Charleroy, a patent of improvement for 15 years, to date from Nov. 19, 1839, for *improvements in the manufacture of window glass*, Sept. 15, 1840.

M. L. Mueseler, of Liege, rue St. Adelbert, No. 14, a patent of improvement for 15 years, for *improvements in the miner's lamp*, for which he obtained a patent, Dec. 23, 1829.—Sept. 15, 1840.

L. P. A. Legoutte-Delacroix, of Jemmapes, province of Hainault, a patent of improvement for 15 years, to date from Aug. 28, 1839, for *improvements in the system of carbonising and distilling fuel*, Sept. 15, 1840,

R. W. Urling, of St. Josse-ten-noode, rue des Arts, No. 139, a patent of addition and improvement for 10 years, to date from Nov. 22, 1837, for *improvements in mule jennies and other spinning machines*, Sept. 15, 1840.

Robert White, of Antwerp, represented by Dixon of Brussels, Hôtel de Groenendael, a patent of importation for 5 years, for *improvement in apparatus for filtering liquids*, Sept. 15, 1840.

A. Judot, of Ixelles, rue Careveld, No. 176, a patent of importation for 5 years, for *a new system of moveable suspension railroads*, Sept. 15, 1840.

T. Edge, represented by Prisse, of Ixelles, rue du Berger, No. 79, a patent of importation and improvement for 5 years, for *improvements in gas-meters*, Sept. 15, 1840.

A. J. Burlée, of Avelange, province of Namur, a patent of invention for 15 years, for *a new construction of flour-mill*, Sept. 23, 1840.

Ignace Duez, of Jemmapes, province of Hainault, a patent of invention for 10 years, for *a tub for the purpose of heating by steam the leys used in manufacturing soap*, Sept. 23, 1840.

Joseph Bower, represented by Urling, of St. Josse-ten-noode, rue des Arts, No. 139, a patent of invention for 10 years, for *improvements in the manufacture of carbonate of soda*, Sept. 23, 1840.

Pierre Kopezynski, of Brussels, faubourg de Flandres, rue du Cheval-noir, No. 4, a patent of invention for 15 years, for *a process of preparing pure salt and other products*, Sept. 23, 1840.

C. J. E. Chaudron-Junot, represented by Delianson Clark, of Brussels, Marché-aux-Poulets, No. 1, a patent of invention for 15 years, for *improvements in the manufacture of carbonate of soda and caustic soda*, Sept. 23, 1840.

Vital Bawens, of Jamise, province of East Flanders, a patent of invention for 15 years, for *a new process of glazing delf-ware*, Sept. 23, 1840.

E. Sacré, of Brussels, rue du Parchemin, No. 1, a patent of invention for 10 years, for *a machine for coloring oil-cloth*, Sept. 23, 1840.

Malmazet sen, Deplanque, son, and Co., of Brussels, place de Louvain, No. 5, a patent of improvement and addition for 10 years, to date from Dec. 27, 1839, for *improvements in looms for weaving figured stuffs*, Sept. 23, 1840.

E. Ellis, of London, represented by Dixon, of Brussels, Hôtel de Groenendael, a patent of importation for 5 years, for *improvements in pumps*, Sept. 23, 1840.

William Baddeley, represented by Loudon, of Ixelles, glacis du Boulevard de Waterloo, No. 1, a patent of importation and improvement for 5 years, for *a new method of obtaining motive power, applicable to locomotive engines and other purposes, and for the manner of applying the same*, Sept. 23, 1840.

L. J. E. Savreux, of St. Josse-ten-noode, rue du Nord, No. 130, a patent of invention for 20 years, for *staining common glass with various vitrified colors*, Sept. 23, 1840.

J. N. Duchemin, of Brussels, rue d'Or, No. 45, a patent of invention for 15 years, for *a lever machine, applicable to rotary engines, without the aid of steam or horse-power*, Sept. 25, 1840.

RAILWAY INTELLIGENCE.
DOMESTIC AND FOREIGN.

Great North of England.—The directors of this national undertaking are making every exertion to open the line between York and Darlington as early as possible. The engine-shed already contains nine powerful engines, with tenders, and coaches for the conveyance of passengers. The coach station and the engine repairing shops, on the Bank Top, Darlington, are on a very extensive scale. Indeed, we believe, they will form the largest building in the neighborhood. The greatest skill and energy are displayed in pushing the works forward; and the whole line presents a scene of the greatest activity and animation.—*Durham Chronicle.*

The number of passengers by the Glasgow and Paisley Joint Railway, from Monday 19th to Saturday 24th instant, amounted to 13,875; the receipts to £467 2s. 1d.; and the average receipts per mile, per day, £11 10s. 8d.

Railways in England.—The following results of calculations, made on the subject of railways in England, will be found interesting:—

	MILES.
Opened, and to be opened in the year 1840 ..	1,258
To be opened within the year 1841	160
To be opened subsequently	330
Total for which Acts have been obtained ..	1,758
Of which the shares are now at a premium....	783
At a discount not exceeding 20 per cent. on the amount of share	461
Total.....	1,244
At a discount exceeding 20 per cent. on the amount of share.....	514
Total.....	1,758

Of the share capital for the above, there is now uncalled for £7,029,000, of which there may be estimated to be called for by the end of 1841 about one-half. Of railways entirely opened exceeding 20 miles in length, there are still at a discount only 129 miles.—*Railway Times.*

RAILWAY ACCIDENTS.

Fatal Accident on the Great Western Railway.—A serious accident occurred on Sunday morning, about 5 o'clock, to the luggage train which left London on Saturday night. The engine-man appears to have forgotten to let off the steam and put the drags on when the train came to the end of its journey at the Faringdon-road station. The engine, the Fire-King, ran into the carriage-house and against a truck loaded with coke: this it knocked to pieces, and scattered the coke in all directions. It then forced down the partition and part of the wall of the building, and ran off the rail, which terminates there, into the adjoining field, where it was upset, and the tender and the carriages were all smashed to pieces but the last, which was hurled back by the concussion 150 yards up the rail. The engine-man and the guard were both killed on the spot; the head of the former is literally crushed to atoms. Four passengers came down by the train, of whom two have broken limbs, and the others are severely bruised. The stoker escaped unhurt, but cannot give any account of how he managed to do so. From the suddenness of the stoppage the passengers' carriage was forced so violently against the tender that it was completely turned over. The fore part of this carriage tilted up, and it was completely doubled over upon the timber-truck. One of the passengers (T. Kitchen) was thrown off upon the rail, and the other three were crushed between the passengers' and the timber-carriage. An inquest was held on the two bodies on Monday, when the stoker was examined, but his evidence threw no light on the cause of the accident. The engine-driver had spoken to him a short time before the accident. *He appeared to be attending to the engine* as usual just before the accident occurred. The stoker said he called to the engine-man when he found they were so near the station, but he did not answer, nor did he shut off the steam. The rate at which the engine was moving was the usual rate of the wagon trains, that of 15 miles an hour. The jury returned a verdict of "Accidental Death" in both cases, adding, that no blame whatever could attach to the Great Western Railway Company or their agents.

Another Accident on the Eastern Counties Railway.—On Thursday evening an accident took place on the line of the Eastern Counties Railway, near Brentwood. The last down train from London to Brentwood started from the Shoreditch terminus about 7 o'clock. On arriving within about one mile of Brentwood, nearly opposite Brook-street, the engineer discovered that some oxen which had been grazing in an adjoining field had got upon the line. He turned off his steam, and used every other effort to slacken his speed, but had scarcely done so before the front of the engine came in contact with two of them. The effect was to throw the engine and tender off the line, which caused the greatest consternation and alarm amongst the passengers; but no injury was sustained. The poor beasts, were killed on the spot, having been mutilated in a dreadful manner. They had got through the fence of an adjoining field on to the line, in consequence, it is stated, of its dilapidated condition.

Accident in Clay Cross Tunnel.—On the morning of Wednesday last, an accident occurred in the Clay Cross Tunnel, on the North Midland Railway. One account states that the coal train was started from Mr. Stephenson's colliery, the engine-driver telling the flagman that he would sound the engine whistle when he had got safely through the tunnel, as a signal that he might hoist a white flag as a notice to the driver of the luggage train (which was expected to arrive from the north on the same line of rails) that all was right. Soon after the entrance of the coal train a down passenger train entered the tunnel at the south end, the driver of which (as usual) sounded his whistle, which the flagman stationed at the north end supposed to be the signal from the coal train, and consequently he lowered the red flag and hoisted a white one. At this moment the luggage train came up at a good speed, and overtaking the coal train (which went at a moderate speed) before it had emerged from the tunnel, smashed several of the carriages and damaged the engine, but fortunately did no further injury. The other account states that no signal was given, and that the flagman hoisted a white flag before the coal train had time to get out of the way.—*Derby Chronicle.*

FOREIGN RAILWAYS.

Since the first of January last, about 3,300 travelling equipages have been conveyed to the different stations on the Belgian railroads, which have produced to government nearly 154,000 frs. This increase of revenue may be considered as an importation of capital into the public treasury, which in fact would have derived no benefit from such a considerable transit by the usual roads, even supposing that the facilities of the railroad had not influenced a great number of foreign travellers to prefer this rapid mode of communication.

The *Journal de Liege* contains a letter from Chaufontaine, dated 13th of October, which says, "the directors of the railroad have had great difficulty in making the tunnel through the mountain between Chaufontaine and Rochelle. So many obstacles presented themselves to the engineer, while making the plan of this section of the railroad, that the excavation of one of the tunnels between Liege and Verviers was looked forward to with anxiety. The activity with which these works are conducted leads us to hope that in a very short time we shall see the line of railroad traverse the valley of Vesdre, passing through the mountains which intercept its progress to Verviers. On the 2d of October, about two o'clock in the afternoon, the day when this tunnel was opened, the superintendant of the railroad accompanied by the engineer went through the subterranean passage, the whole extent of which was lighted by torches, which presented a very brilliant *coup-d'œil.*"

Railroads in Germany.—The engines used on the Prussian and Saxon railroads are for the most part made at Manchester and Bolton; of course they pant, groan, and scream as our English engines do. The first, second, and third class coaches are the same as ours to a tittle; the modes of distributing tickets, the police, flags, &c., are all identical; the terminal stations at Berlin, Dresden, Leipsic, and Mageburg are well nigh equal to our best, the intermediate stations much in the same ratio. The railroad between Leipsic and Dresden, 70 miles long (a distance gone over in three hours and a half), was completed for about £600,000. There are but four bridges on the whole length; one tunnel, however, half a mile long, near Dresden, where the hill rising gradually into the mountains of the Erzegeborge, contracts upon the Elbe, and forms a beautiful scenery on each side of the railroad. It seems absurd, however, to study or even speak of landscape at the rate of 20 miles an hour. One strange effect noticed on this railroad is, that in passing through a dense forest of fir trees the noise echoes back from the multitude of naked stems as if all the hailstorms in the year were concentrated into one. Another railroad journey is from Leipsic to Magdeburg, 75 miles.

There are now 2,270 miles of railroads completing or nearly completed in the United States, besides 2,346 miles of railroads in progress of construction, making a total (when finished) of 4,616 miles.

The Taunus Railway.—This railway derives its name from the Taunus Mountains, along which it extends; it connects the commercial city of Frankfort-on-the-Main with the steam navigation on the Rhine, the important city and fortress of Mentz, and the much-frequented watering-place of Wiesbaden, and passes through the territories of the free city of Frankfort, of Hesse Darmstadt and of Nassau. The company for the construction of this railway was formed in 1836, and the capital of 3 millions of florins (or £250,000 sterling) subscribed. Owing to the high value of the lands in this section of country, and the circumstance of the railway being located through three different territories, great difficulties were experienced in the procuration of the right of way, which at the same time has cost the company an enormous sum. The construction of the railway was commenced in 1837; in September 1839 the section between Frankfort and Hochst of 5 miles was opened for public use, and in April 1840 the whole line from Frankfort to Mentz and Wiesbaden.

The principal object of the Taunus railway is the conveyance of passengers between the above-mentioned places, and from its favorable position it will always command a passenger traffic, and may be classed amongst the important and profitable lines of internal improvement in Germany. Frankfort, with a population of 50,000, is the centre of a considerable intercourse; there are constantly from 10 to 20,000 strangers in the city, coming from and continuing their journey to every part of the Continent. Mentz contains 36,000 inhabitants, besides a garrison of 20,000 men; and the population of Wiesbaden is 12,000. The river Main, on which Frankfort is situated, and which empties itself into the Rhine at Mentz, is not navigable for steam-boats, owing to the shallowness of its water during summer. At Mentz the steam-boats from the upper and lower Rhine meet, and the railway trains run in connection with them. Still more important and prosperous the Taunus Railway must become, when its projected continuation to Heidelberg on the one, and to Hanover and Hamburg on the other side, shall be executed.

The construction of this road resembles that of the English railways, of which it is an imitation.

The excavations and embankments were made for a double track, the width of the road bed is 24 feet.

The clear width of the track is, as in England, 4 feet 8½ inches; the bridges and culverts were all built of stone, with the exception of two over the fortifications at Cassel, which have a wooden superstructure. The longest bridge is that over the Nidda, which has three arches of 33 feet span each.

There are at present on the railway six locomotive engines from the manufactory of Robert Stephenson and Co., Newcastle-upon-Tyne; they have 12 (some 13) inch cylinders, 18 inch stroke and 6 feet driving wheels; 100 passenger carriages of four different classes; the first and second class carriages are closed, and contain each 18 seats, in three departments; the third and fourth class carriages are open on the sides, and have room for 30 to 40 passengers. The carriages were manufactured partly in Hochst and partly in Frankfort; the price of a second class carriage is £170, that of a third class one £125.

Of the capital stock of the company (£250,000 sterling) about £180,000 have been expended for the railway, buildings, fixtures, and material, which is at the rate of £6,667 sterling per mile.

There are daily five trips made between Frankfort and Cassel, and seven between Cassel and Wiesbaden, and the fares are, for a seat from Frankfort:—

	To Mentz.		To Wiesbaden.	
	s.	d.	s.	d.
In 1st class carriage .	3	6	4	6
2d class ditto....	2	5	3	0
3d class do.....	1	8	2	1
4th class do.....	1	2	1	5

The fare for way passengers is the same in proportion to the distance. From the above it appears that the charge per passenger per mile is:—

In 1st class carriages	2·08d.
2d class do.....	1·38d.
3d class do.....	0·96d.
4th class do.....	0·65d.

Each passenger is allowed 40lbs of baggage; for every lb. exceeding this quantity he is charged at the rate of about 3s. 4d. per 100lbs, for the whole distance from Frankfort to Wiesbaden. The charges for over-weight of baggage are, therefore, as high as for the same weight of passengers in carriages of the first class.

At an average there are from 12 to 14 carriages in a train; with this load the engines travel at the rate of 20 miles per hour. The engine-men regard 14 carriages as a full load for the locomotives, if they have to travel at that speed. Coke fuel is used, made from coal on the Rhine: the quantity used for a trip between Frankfort and Wiesbaden, 23 miles, is 1,200 pounds, and the price is 2s. per 100 pounds delivered to the railway. The expense for fuel is therefore per mile of travel nearly 1s.— *Abridged from the Railway Magazine.*

Railroad in New South Wales.—The attention of the Sydney interest in the City has been strongly excited by a proposal of Mr. A. Polack, the "George Robins" of Sydney, a very considerable capitalist, and a gentleman of experienced judgment, to form a railroad from Sydney to Parramatta, a distance of fifteen miles. The road at present between Sydney and Parramatta is very bad.

LITERARY NOTICE.

A Glossary of Civil Engineering, comprising its Theory and Modern Practice. By S. C. Brees, C. E., &c. London; Tilt, and Co.

This work is intended by the author as an elementary treatise on a subject with which every one must now become acquainted. It comprises within one volume the whole arcana of the science, arranged in alphabetical order. Railways and locomotives are of course its more prominent features, inasmuch as they are the subjects at present most interesting in civil engineering, but they occupy by no means a disproportioned space, for room is found for a due consideration of common roads, bridges, coffer dams, breakwaters, canals, steam engines, windmills, &c. &c. There are numerous well executed wood-cuts which illustrate and embellish the work. The alphabetical order in which the "Glossary" is arranged affords great convenience as a work of reference, but we question whether it would not have been better, in a book professing to be elementary, to have given the multifarious and valuable information which it contains in a continuous form. This, however, is a matter of opinion, but there can be scarcely any question respecting the merits of the work itself. It affords a fund of knowledge on matters becoming of increasing interest, in a manner that cannot fail to be agreeable, and we feel assured may be depended on.

We subjoin the following extracts, and shall perhaps borrow more from its pages in subsequent numbers:—

THE FIRST RAILROADS.

"Railroads were first used in the collieries; particularly in those of the north of England, and horses were exclusively employed upon them for many years, and very little attention was bestowed upon the gradients or inclinations of the road. The horse was consequently obliged to exert himself according to the utmost of his power for a short distance, after which he might not be required for some time, and it was customary for the men to unhook him and allow him to follow after the wagons, at very rapid descents, where the gravity was sufficient to propel the wagons. Accidents were very common upon the "runs" or inclines, although a break or convoy was employed to check the wagons; but they were frequently prevented acting in damp or wet weather, owing to their imperfect construction and the steepness of the planes. Ashes were often strewed over the rails, to assist the working of the break, notwithstanding which, the works were often stopped. Thus if a shower occurred when a train was descending a very steep plane, it let them down at a fearful velocity, and, despite of ropes which were drawn across the railway to stop them, fatal results sometimes ensued, as the ropes were frequently broken. These early railways general descended in the direction of the delivery of the goods conveyed upon them. The wagons were therefore easily drawn back when emptied. The gross load upon the wooden rails was about two or three tons, but upon the introduction of iron train-rails a horse took nearly double; whereby the velocity of the train down the inclined planes was much increased, which is supposed to have originated the idea of self-acting inclined planes."

ORIGIN OF STEAM NAVIGATION.

"One of the first instances, if not the first, of a vessel being absolutely propelled by the power of steam, was that by the Marquis de Jouffrey, which took place upon the Saone, at Lyons, in the year 1782. The next was construeted under the direction of a Mr. Miller, in the year 1789, and succeeded very satisfactorily on the Forth and Clyde Canal; after which, several experiments were made; and that of the celebrated Ameriean engineer, Mr. Robert Fulton, was among the most suecessful, the engines having been supplied and fitted by Messrs. Boulton and Watt. The vessel was named the "Vermont," which was the first steam-vessel run as a regular packet-boat, having been launched at New York, in the year 1807, and plied between that city and Albany, a distance of about 150 miles; performing the voyage in thirty-two hours, which gives a speed of about five miles an hour, (about one-third the speed now obtained). The length of the boat was 133 fect, depth seven feet, breadth 18 feet; the boiler was 20 feet long, seven feet deep, and eight feet broad, and with only one steam-cylinder, which was two fect diameter, and four feet stroke of piston; the paddle-wheels were 15 feet diameter, (dipping two feet into the water), and four feet broad, and the burden was 160 tons.

"It was not until 1812 that a steam-packet experiment was again attempted in this country; which occurred on the Clyde; another was tried at Bristol; and these were shortly after followed by many others; at length they became pretty general —although the engines were of very imperfect construction, one steam cylinder only being employed, whereas two are now invariably used, each working a crank, fixed upon the axle of the paddle wheels, and situated at right angles to each other, so that when one is passing the dead points, the other is exerting its greatest power.

"Steam-packets commenced making regular sea voyages in the year 1818, and they have continued extending their bounds ever since."

PATENT AGENCY FOR IRELAND.

We beg to recommend our agent for Ireland, Mr. Richard Telford, 109, Stephen's Green, Dublin, as the most eligible person whom patentees can employ for the sale of their articles in Ireland. Having a most extensive and respectable connexion, and the house being well known as a depot for patent goods, inventions, &c., we have no doubt of his efficiency to promote the interest of those parties who may favor him with their business.

Mr. Telford also undertakes every description of Patent Agency business for Ireland.

TO CORRESPONDENTS.

Gratuitous Copies of our Journal have been forwarded to a number of Individuals interested in some Patent, or Invention, of which notice has been taken in our number of to-day.

"The Inventors' Advocate" *is published every* Saturday Morning, *at* 7 o'Clock; *if, therefore, our Subscribers do not receeive their copies* regularly *from their Newsmen, the fault never rests with* us.

For the convenience of persons residing in remote places, *the* "Inventors' Advocate" *will be regularly issued in* Monthly Parts, *stitched in a handsome wrapper.* Parts 1 *to* 16, are now Ready.

Advertisements *should be sent in not later than* Thursday Evening.

Two *numbers of the* "Inventors' Advocate" *(Nos.* 48 *und* 49*) were published* July 4. *The former contains, in addition to the usual varied matter, the* Title Page *and a* Copious Index *to the* Second Volume.

Volume II. *of the* "Inventors' Advocate," *handsomely bound, is* Now Ready. *A* Few Copies *of the* First Volume *still remain on hand.*

"P. S.," *and the* "Debating Society at Woolwich," *will find the question of perpetual motion discussed in the* 38*th number of the* Inventors' Advocate, *and the causes of its impossibility pointed out. The notion that a reward is offered by the government for the discovery of perpetual motion rests, we believe, on no better foundation than the supposed reward for the discovery of a Queen Anne's farthing.*

"A. L." *is reminded, that his promise of furnishing an account of his new invention, has not been fulfilled.*

The injustice complained of by "A Sufferer," *is, we fear, without remedy in the present state of the law.*

TO CAPITALISTS, MANUFACTURERS, AND TRADERS.

Among many VALUABLE INVENTIONS *and* PATENTS *registered at the* PATENT OFFICE, BRITISH and FOREIGN, (198, Strand), *for the investment of capital, Shares are offered for sale in the following Useful Inventions:—*

A Fire Escape of Novel Construction, which may be used as an Observatory.

A Cheap Lamp for burning Tallow and Grease, without overflow or smell.

Patent Screw Jack, for lifting locomotives and other great weights.

An Improved Balance, applicable to small or great weights.

Important Improvement in Wood Paving.

A New and Improved Method of Burning Coke.

New Methods of Purifying and Treating Oils.

Patent Forge Back.

A new Castor for Furniture.

Patent Process for the Manufacture of Soda.

Improved Methods of Building Iron Ships.

A New Method of Tanning.

The Purification of Gas.

TO INVENTORS.

PERSONS WHO WISH TO OBTAIN OR DISPOSE OF PATENTS, *or to bring* NEW INVENTIONS INTO USE, *are requested to apply to the* PATENT OFFICE, BRITISH and FOREIGN, No. 198, STRAND, *opposite St. Clement's Church, where they will meet with great facilities to obtain information and to carry out their views.*

THE GALLERY OF INVENTIONS,

Attached to the Patent Office, is a spacious Saloon, well lighted, in which Plans and Models are exhibited. It affords an excellent medium for bringing New Inventions into public notice.

THE

INVENTORS' ADVOCATE,

AND

JOURNAL OF INDUSTRY.

SATURDAY, OCTOBER 31, 1840.

*** *The Office for the publication of* THE INVENTORS' ADVOCATE, *is removed from Tavistock Street, Covent Garden, to the Patent Office, British and Foreign,* 198, *Strand; opposite St. Clement's Church.*

The suggestions we made last week for the prevention of railway accidents were scarcely written before a fatal accident occurred on the Southampton line, which would not have happened had one of the plans suggested been adopted; and the necessity of adopting the other plan was fatally experienced on the Great Western railway not many hours after the suggestion was printed. It must be admitted, that had a *permanent signal of danger* been hoisted, to be removed only temporarily, when the trains are approaching, if all be then clear and safe, the neglect of the signal-man on the Southampton railway would not have mattered. The danger-signal would have been there instead of the signal of safety, and the engine-driver would have been warned, though the man was absent from his post. Even had the road been clear, the neglect of the signal-man to remove the red light and to substitute the white one would only have been attended with the inconvenience of a trifling delay, instead of the loss of life, and severe personal injuries. The plan may be so readily tried, and its advantages so far exceed any probable inconvenience, that we cannot too forcibly urge its adoption. Instead of considering, as the Southampton railway management would seem to consider by having a stationary white light signal, that the road is constantly safe and clear, it should always be considered in a state of danger, unless signals to the contrary are given. On all those points where it is thought necessary to station policemen, danger should be the rule, and safety the exception. The neglect or absence of a policeman would then produce no other consequence than that of a short delay: at present it involves the loss of life and limb.

The accident on the Great Western railway on Sunday, affords an additional instance of the gross neglect so frequently observed in the present engine-drivers. Whether the man was asleep at the time, or whether, as seems most probable from the evidence, he was attending to the machinery of the engine, and was not aware how close the train was to the station, either case would have been provided for had our suggestion of placing the engineer under the command of a conductor or guard, been adopted. Had there been a guard stationed in a commanding situation on the engine or tender to keep a proper look-out, and if the engineer, thus freed from that duty, had been ready to shut off the steam or reverse the motion the instant he received commands from the guard, the fatality would not have occurred.

Past omissions cannot now be recalled; but the directors ought at least to learn by dear-bought experience, and take every precaution to avoid the fearful disasters which as railways are now managed may happen at any moment. The consideration of expense when the safety of hundreds is at stake ought not to have any weight in the balance; and if by the appointment of responsible officers, to take the command of the trains, any additional safeguard can be obtained, such an appointment ought to be immediately made. An arrangement of this kind, which would in a great measure remove the responsibility from the present engineers to superior officers, is the more essential when we consider the low and often untrustworthy class of men who at present comprise the engineers, of locomotives. The guard, or *captain of the train*, ought to be himself conversant with the management of locomotive steam-engines; but this would not be absolutely essential, if, on the first adoption of the plan, a sufficient number of engineers properly qualified by skill and good conduct, could not be found to undertake the office.

ERRONEOUS NOTIONS OF BUOYANCY.

The accounts published in the daily papers of the destruction of the steam-packet Phœnix by collision with a rival steamer, exhibit an instance of popular error respecting the buoyant properties of articles specifically lighter than water when put on shipboard. It is stated, in the accounts of the disaster, that the Phœnix had on board a quantity of tallow in casks, and it is added "there is no doubt the tallow in the hold of the vessel kept her afloat so long, and to this fortunate circumstance may be attributed the preservation of the people on board." The buoyant property of the tallow is here represented as having been the means of saving the lives of the passengers and crew; but such an opinion is in reality without foundation. A vessel freighted with the same weight of tallow and of iron would in each case draw the same quantity of water. Suppose the vessel to be half filled with tallow, and that it then drew six feet of water; the quantity of iron equivalent in weight to the tallow would only occupy one-eighth part the space. In the one case, therefore, the vessel would be half filled with tallow and half filled with air; and in the other case there would be one-sixteenth part of iron and fifteen-sixteenths of air. As air is about eight hundred times lighter than tallow, the quantity of buoyant cargo would be much greater, in proportion, on board the vessel freighted with iron than on the other. The air, it is true, is not confined in casks, but so long as it is not displaced by water, its buoyant tendency is just the same as if it were enclosed. If into two vessels thus circumstanced, water were to be poured in equal quantities, each additional ton of water would have the same effect in sinking them as if the same weight in a solid mass were put into the hold. They would each sink alike, provided the quantity of tallow were not sufficient to float the vessel when filled with water. The difference, if any, would be in favor of the iron-freighted vessel, for as the water would run into the comparatively empty space in the hold, it would not rise so soon into the cabins; consequently the passengers would be able to escape more readily from a sinking vessel with a cargo of iron on board, than they would were the cargo of the same weight to consist of tallow. On another account, too, the vessel with iron in the hold would be the safer. The superior weight in the hold would keep the ship from rolling over, whilst a vessel loaded with tallow would become top-heavy before it was filled to the sinking point.

NEW INVENTIONS.

NEW MODE OF EXTINGUISHING FIRES.

At a lecture on combustion, delivered at the Mechanics' Institution at Cheltenham, on Monday, Mr. E. W. Wells, chemist of that town, brought forward two plans, which he suggested for extinguishing the largest fires in a very short time. After explaining that common combustion could not be supported without a supply of oxygen, he stated that his first plan of extinguishing fires consisted in shutting out the supply of oxygen by the following means:—"For instance, iron plates, with a wet incombustible compressible substance projecting from the edges, might be erected against the windows and doors, and sustained by inclined poles; the oxygen of the interior of the house being only one fifth of the whole air would be immediately absorbed, and none in addition being admitted the combustion would inevitably cease." The lecturer by means of lighted candles, placed in a large glass vessel, proved the correctness of this theory. The next plan was to suffocate the flames by carbonic acid gas. He recommended the construction of a large machine, capable of containing about one ton of carbonate of lime, a proper proportion of water, and about half-a-ton of sulpuhric acid; the contact of these materials being regulated by valves and tubes, an immense quantity of carbonic acid gas could be generated and conveyed by its own pressure to the interior of the house; combustion could not then for a moment exist. Mr. Wells announced that he inteuded to lay his plans before the Government, and, if he could get no assistance from that quarter, to form a joint-stock company to construct the machines described.

PROCESS FOR ENAMELLING IRON VESSELS.

We have witnessed several interesting experiments, calculated to test the success of an important discovery in the art of manufacturing cast-iron cooking vessels, by Messrs. T. and C. Clarke, iron-founders, of Wolverhampton. English manufacturers of articles technically denominated "hollow-ware," have for many years been sorely puzzled concerning an ingenious and beautiful method, practised in Germany, of lining iron culinary utensils with a smooth white enamel, resembling porcelain, which far surpasses, in point of cleanliness and durability, the English system of "tinning" the interior surface. Indeed, so desirable has this art been considered by our countrymen, that, with

their usual entorprise, considorable sums of money and a most liberal expenditure of time and talent have been for many years employed in seeking to discover the process. Until the present instance, however, every effort proved fruitless. Several of our manufacturers, it is true, have contrived to line the vessels with an enamel equal or superior in appearance to that of the foreign article; but this enamel cracked, chipped, and would not stand the fire; and the grand secret, which, of course, is the production of an enamel which shall so expand and contract with the metal as not to chip or crack, remained as much unknown as ever. Messrs. T. and C. Clarke, however, have at length most perfectly succeeded, and having, of course, secured a patent, are now manufacturing an article in every way superior to that of their Continental rivals. The manufacturers of British hollow-ware have always surpassed those of Germany in the lightness and elegance of their castings, so that Messrs. Clarke are enabled to add this advantage to that of at least equal excellence of enamel. The German enamel is found to wear as long as the iron vessel itself, but we believe it will scarcely stand the severe test to which we have seen Messrs. Clarke's article subjected—viz., that of heating an enamelled saucepan to a white heat, and then plunging it suddenly into cold water, until cooled, without either the vessel cracking or the enamel being damaged or discolored. Another experiment consisted in placing one of the vessels filled with water upon a large fire, and allowing it to remain until the water had completely boiled away, and for some minutes afterwards, without in the slightest degree injuring the vessel or its enamel. The great importance of the application of this discovery to our own manufactures is, that the hollow-ware manufactured in this country may be purchased at less than half the price of that imported from the Continent.—*Staffordshire Examiner.*

SUBMARINE EXCAVATOR.

Captain Manby, the inventor of the admirable apparatus which bears his name for saving lives in cases of shipwreck, has this week communicated to the Lord Mayor of London, for the purpose of publicity, an account of a machine which he has invented for clearing the beds of rivers, for the removal of bars at the entrance of harbours, &c. This machine he calls a submarine excavator. The removal of these obstructions he says, "can only be effectually accomplished by excavation. Such a principle has long been known for scraping away mud in the front of sea sluices, and swept away by a rapid rush of confined back water or opening of sluice gates; and my pretensions to originality are by adding spades to the back of scoops to dig into such obstructions, and emptying such excavated matter into trays having an inclination from their centres to their ends for the soil so raised to run off at their extremities for a powerful tide or current to carry it away, which, I flatter myself, will effectually and effectively perform at a small expense and in a very expeditious manner what could only be accomplished at much cost, and attended with immense labor, to diminish the accumulations either in rivers or channels, thereby increasing the velocity of the current to produce an accelerating scouring power, which, by an occasional repetition of the implement when required, will assuredly prevent a barrier collecting, by the aid of a steam tug; and I feel confident might be most successfully applied and importantly useful in the river Thames to keep channels in direct position, especially near the bridges."

SCIENTIFIC CORRESPONDENCE.

CAUSE OF CHANGES ON THE EARTH'S SURFACE.

To the Editor of the "Inventors' Advocate."

Sir,—I cannot admit with *Mr. Cavalier* "that a revolution of the earth *en masse* latitudinally has taken place." As I consider *the upheaving* of continents, the *submersion* of others, and *the internal heat* of the earth, sufficient causes of the alteration that has taken place in the climates on the earth's surface.

A *supposed* "deluge" would in all probability have produced some effect thereon. In regard to *the upheaving* of whole continents, Mr. Cavalier remarks, "I beg to state, that this theory, which once dawned, has had its day, the earth no longer being regarded as a volcano; the simple fact of the recession and advance of the ocean being sufficient to show the cause of the appearance and disappearance of dry lands." Now, most of our eminent geologists admit the central parts of the earth to be in a state of incandescence.

"It is very conceivable, that in the early stages of the cooling of the globe, a moderate general warmth of 30°, 20°, 10°, &c., might be successively communicated from the interior to the surface; and it has been already seen that this uniform addition to the effects of the solar radiation, would supply in northern zones, as far as 70°, 60°, 50°, 40°, &c., of latitude successively, the temperature requisite to allow of coral reefs in the sea, palms and tree-ferns upon the land, and crocodiles and other huge reptiles in the rivers and estuaries."

"On the whole, until the *sufficiency* of a peculiar position of land and sea to meet the phenomena of a change of climate is *proved*, and some independent ground of definite *probability* is assigned for the occurrence of such a position, it would be premature to recognise in the present aspect of the hypothesis which proceeds upon that assumption the features of a *true theory*; but it would be equally unjust to condemn it as false, for it is *not disproved*; and no one has shown that such positions of land and sea as *Mr. Lyell* has contemplated, may not require a determinate *probability* among *other consequences* of a *general theory*. In the mean time, that admirable writer has conferred no small benefit on geological theory by introducing for consideration this elegant and consistent speculation."

"That the doctrine of the progressive cooling of the globe is to be now received as an established theory, those who desire the real progress of geology will prevent themselves from affirming; and, perhaps, few who have attended to the *inferences* contained in these volumes will hesitate to believe that it will one day become so. It is no small argument in favor of this hypothesis (as it must still be called), that it appears to include easily and obviously so many of the leading and general truths established by geological observation. The figure of the earth, its density, the actual temperature of its surface and interior parts, the general floor of igneous rocks below the strata, the repeated formation and uplifting of such rocks, the great and systematic fractures of the earth's crust, are all capable of explanation by this one *consideration*." *Vide* Professor Phillip's Treatise on Geology, vol. ii, pages 276 and 277, (Lardner's Cabinet Cyclopædia, 1839); see also chapters 9 and 10 of the same work.

The Professor has, however, it seems, discarded the paragraphs referred to by *Mr. Cavalier*, as I find no mention of them in this treatise.

I have already stated, that there is no appreciable motion of the poles, relative to the plane of the present equator, consequently there cannot be any *recession* or *advance* of the ocean relative thereto; and, therefore, it cannot effect the *appearance* and *disappearance* of dry land; and a *consecutive* motion of the obliquity of the ecliptic could not possibly produce that effect. Were the sun vertical to the poles, there would not be a difference of ten feet between the tides in this case, and that of his being vertical to the equator.

The above description of *Mr. Lyell's* theory is not selected because it conveys it in the strongest terms, but more especially on account of the Professor's liberality in his remarks thereon, and being moreover referred to by *Mr. Cavalier, as no mean authority.* The following is the latter part of the first paragraph quoted by *Mr. Cavalier;* viz.,—The only leading event really influential in the point, which we may imagine possible, though astronomers give no encouragement whatever to the admission of it as a basis of speculation, "is a change of the position of the earth's axis."

That this idea is fast gaining ground seems to be involved in some doubt, inasmuch as it appears, by the Professor omitting it in his *Cabinet* Treatise on Geology,* that he has retracted the same.

The theories of astronomy and geology ought to agree with each other, and as no such motion has hitherto been discovered by astronomers, geologists ought, therefore, not to contend for what in reality does not obtain, as the protuberance of the earth and planets at their equators sufficiently testify, as well as astronomical observations.

For further information relative to *central heat, upheaving* and *submersion* of continents, &c., and *variation of climates*, consult Messrs. Bakewell's, Buckland's, Burr's, Delabeche's, Lyell's, Macgillivray's, Ure's, &c., respective treatises on geology.

I am, Sir,

Lynn Regis, Yours respectfully,
Oct. 23, 1840. J. Utting.

PREVENTION OF RAILWAY ACCIDENTS.

To the Editor of the "Inventors' Advocate."

Sir,—Having heard of so many railway accidents, I venture to send you my ideas. If you think them any way likely to benefit the public, you will oblige me by inserting them in your valuable publication.

The first is, that there might be an iron fastened to the axletree of the carriage of the engine, passing down to the inside of the rail, to have a foot turned up under a flange, to be riveted or cast on the rail. This, I think, will prevent the carriages going off the line. The next thing I propose is, to have a carriage or conductor before the engine, forty or fifty feet, and the front part to be constructed so as to clear every thing out of the way of the train. The front part must be made something similar to the part of a plough that turns over the earth, and to run down within an inch of the top of each rail, so that it may throw every thing out of the way. This conductor or carriage is to be attached to the train by strong spiral springs, and a clip to pass on each side right through the train, to stop the progress of the carriages, in case of two trains coming in contact with each other, which would in a great measure prevent the sudden concussion. The next thing is, the tongues that turn the carriages from one line to the other. They should be self-acting, so that the train can run to any place, and turn off into another line, without depending on any person to turn the tongues. This might be done by having a spring attached to the tongues, and a moveable pin attached to the conductor, so as to turn them at pleasure. I am, Sir,

October 19, 1840. Yours, &c., &c.,
Duke Street, Bloomsbury. J. Sperring.

THE SCIENTIFIC SOCIETIES OF LONDON.

In times like the present when the multitude of investigations and discoveries of science tend much to the benefit and welfare of the British nation, our scientific bodies must be regarded as the great means of promoting the advancement of theoretical and practical knowledge, by giving a listening ear to the theories advanced by the many practical and theoretical members, of which they are for the most part composed. The system adopted in most, nay even in all of them, of submitting the communications to a committee, prior to their being read at the ordinary meetings, is proof sufficient of the principle they hold out to the public and to their individual members, of making known to the world even in the usual limited manner (through the medium of their proceedings and transactions) such

* I had no reference to this treatise *previous* to this paper being written.

information, applications, or discoveries deserving attention. In many of the leading societies, such as the Royal, the Geographical, the Geological, and others, prizes in the form of medals or grants of money, (usually left for the purpose by eminent individuals,) are annually awarded to those whose researches in the particular branch of science embraced by the scientific body offering them, merits the greatest share of attention. We have already noticed some months since the individuals who meritoriously obtained these awards of merit from the above-named bodies, including at the Royal Society Mr. Robert Brown, the most distinguished vegetable physiologist Europe can boast of; Dr. Martin Barry, whose researches on the Developement of the Embryo have caused him to hold a high station in the sublime and extensive department of animal physiology; likewise to Mr. Ivory, whose superior mathematical attainments, even in the days of the presidency of Sir Joseph Banks and Sir Humphrey Davy, were encouraged by a like token from their hands. These are instances only of one body out of many encouraging a spirit of enterprise and emulation amongst its talented fellows; the results of the labors of these devotees to science, independently of the high character they acquire in the British nation, and more especially on the Continent, prove either directly or indirectly of benefit to their fellow laborers.

On Monday next, November 2d, commences the grand scene of action in the metropolis, at least among scientific men. The various learned bodies commence operations, some meeting weekly, others every fortnight, and others once a month only, depending on their particular branch of science and the number of *working* members. This generally depends on the number of communications, and the quality of such, that can be relied on consecutively. At the head of the reports, it will be observed, as last year, that a weekly account will be given with the days and hours of meeting attached, derived at all times from the most correct sources. From our intimate acquaintance and connection with the functionaries of most of them we anticipate being able during the forthcoming session to supply a greater number of reports than we have hitherto done. Every effort will be exerted to render this portion of our journal as interesting and communicative as possible, in connection with any new matter which may be brought before the attention of the several societies.

For the advantage of reference we subjoin a list of the recognised scientific bodies of the metropolis, with the places and hours of meeting &c. during the session 1840-41.

Royal Society, Somerset House. Every Thursday from November 22 to the middle of June; 8½ P.M. Anniversary, November 30, 1 P.M.

Royal Society of Antiquaries, Somerset House. Meetings the same evenings as the Royal Society, 8 P.M. Anniversary, April 23, 3 P.M.

Linnæan Society, Soho Square. Every first and third Tuesday in the month, from November to June, 8 P.M. Anniversary, May 25, 1 P.M.

Horticultural Society, 21, Regent Street. Same as the Linnæan, at 3 P.M., except in the winter months, and then the first Tuesday, at 2 P.M. Anniversary, May 1, 1 P.M.

Royal Medical and Chirurgical Society, 53, Berners Street. Every second and fourth Tuesday in the month, from November to June, at 8½ P.M.

Institution of Civil Engineers, 25, Great George Street, Westminster. Every Tuesday from January 15 to June 31, at 8 P.M. Anniversary, Jan. 21, 7 P.M.

Zoological Society, Leicester Square. Every second and fourth Tuesday throughout the year, at 8½ P.M. Anniversary, April 29, 1 P.M.

Electrical Society, 7, Adelaide Street, Strand. Every first and third Tuesday, from November to June, 8 P.M. Anniversary, May 16.

Architectural Society, 25, Lincoln's Inn Fields. Every first and third Tuesday, from November to June, 8 P.M. Anniversary, October 31.

Society of Arts. Every Wednesday, at 7½ P.M., from November to June. The *Illustration* Meetings the second Tuesday in the month, from November to June, at 8 P.M.

Geological Society, Somerset House. Every first and third Wednesday, from November to June, at 8½ P.M. Anniversary, Feb. 21, 1 P.M.

London Institution, Finsbury Circus. The first Wednesday in the month, from January to May, 7 P.M. Anniversary, April 30, at 12.

Medico-Botanical Society, Sackville Street. Every second and fourth Wednesday in the month, at 8 P.M., from November to June. Anniversary, January 16.

Graphic Society, Thatched House Tavern. The first Wednesday in the month, from January to June.

Royal Society of Literature, St. Martin's Place. Every second and fourth Thursday in the month, from November to June, at 4 P.M. Anniversary, April 30, 3 P.M.

Numismatic Society, Somerset House. Every fourth Thursday in the month, from November to July, 7 P.M. Anniversary, July 16, 3 P.M.

Royal Astronomical Society, Somerset House The first Friday in the month, from November to June, 8 P.M. Anniversary, February 14, 3 P.M.

Royal Institution, Albemarle Street. Every Friday evening, from 25 January to 13 June, 8½ P.M. Anniversary, May 1.

Botanical Society, 20, Bedford Street, Covent Garden. Every first and third Friday in the month, from November to June, and every first Friday the remaining months, 8 P.M. Anniversary, November 29, at 8 P.M.

Royal Asiatic Society, 14, Grafton Street. Every first and third Saturday in the month, from November to March, and every first Saturday after that month until June, 2 P.M. Anniversary, May 9.

Westminster Medical Society, Exeter Hall. Every Saturday, from November until the end of April, 8 P.M.

Mathematical Society, Crispin Street, Spitalfields. Every Saturday throughout the year.

Royal Geographical Society, 21, Regent Street. Every second and fourth Monday in the month, from November to June, 9 P.M. Anniversary, May 25, 1 P.M.

Entomological Society, 17, Old Bond Street. Every first Monday in the month throughout the year, 8 P.M. Anniversary, January 27, 8 P.M.

Statistical Society. Every third Monday in the month, from November to June, 8 P.M. Anniversary, March 16, 3 P.M.

British Architects, 16, Grosvenor Street. Every first and third Monday in the month, from December to July, 8 P.M. Anniversary, May 4, 3 P.M.

United Service Institution, Middle Scotland Yard. Every first and third Monday in the month, from March to June, 9 P.M. Anniversary, March 7, 2 P.M.

Medical Society, Bolt Court, Fleet Street. Every Monday, from November to end of May, 8 P.M. Anniversary, March 9.

Uranian Society, 20, Bedford Street, Covent Garden. Every first Tuesday in the month throughout the year, 8 P.M.

Meteorological Society, 20, Bedford Street, Covent Garden. Every second Tuesday in the month, from November to July, 8 P.M.

ORIGINAL REPORTS OF SCIENTIFIC MEETINGS.

(Contributed expressly to the Inventors' Advocate.)

Meetings of the Scientific Bodies of London,—for the Week commencing November 2, 1840.

Monday.	Entomological Society	8 P.M.
	Medical Society	8 P.M.
Tuesday.	Linnæan Society	8 P.M.
	Horticultural Society	2 P.M.
	Uranian Society	8 P.M.
Wednesday.	Society of Arts	7½ P.M.
	Geological Society	8½ P.M.
Thursday.	Zoological Society	3 P.M.
Friday.	Botanical Society	8 P.M.
	Royal Astronomical Society	8 P.M.
Saturday.	Royal Asiatic Society	2 P.M.
	Westminster Medical Society	8 P.M.
	Mathematical Society	8 P.M.

MICROSCOPICAL SOCIETY.

Oct. 21. Professor Owen, F.R.S., &c., in the Chair. (Continuation of last week's Report.)

The second communication read was, "On a new Variety of Vascular Tissue, found in a fossil wood, from the London Clay;" by J. G. Bowerbank—of which the following is an abstract:—

This singular variety of tissue occurs in a fossil dicotyledonous wood, from the London clay of Herne Bay, Kent. The texture of the mass is very similar to Bovey coal, but more carbonaceous. It is in the possession of Mr. Samuel, the lapidary. Longitudinal sections could only be obtained, and when a polished surface in this direction is viewed with a lens of an inch focus, it presents an appearance somewhat similar to that of beech, exhibiting the silver grain or divergent layers, in much the same manner as in that wood, but with larger vascular tissue. A thin section viewed as a transparent object with a power of 100 linear, numerous large vessels are observed, the greater number of which are of that variety of annular vessel which has the annulations very much interrupted and divided into small portions of various sizes. Occasionally large vessels are seen so very thickly covered with numerous minute dots, which, when viewed with a power of 150 linear, appear to be numerously dispersed over the surface of the vessel, and to have each of them a dark line passing through its centre at right angles to the axis of the vessel.

In a specimen from the same mass of wood, in the possession of Mr. R. H. Solly, the lines do not appear to repose immediately upon the dots, but to be slightly separated from them, and to be somewhat nearer to the external surface of the vessel; but this is not observable in any of Mr. B's. specimens.

Shortly after showing this curious tissue to Mr. Edwin Quekett, Mr. B. was much gratified to learn that he had found an instance of its occurrence in a recent wood, which proved to be *Piper nigrum* (black pepper). Upon closely examining the vessels in the recent specimen, the structure of the dots and lines appeared to be exactly the same as those in the fossil, and the general aspect of the wood was also exceedingly similar; so that little doubt remains of their being either of the same natural order, or of orders very closely allied. "This is rendered more probable," observes Mr. Bowerbank, "from having in my possession several fruits from the London clay of the Isle of Sheppey, which present very strong appearances of either being true *Pipers*, or very closely allied genera; and the probabilities of this being the case are further strengthened by the frequent occurrence in Sheppey of fossilised species of *Nipa*, and other high tropical genera, which are now only found existing in the islands of the Indian Archipelago."

Another curious form of tissue was likewise observed in a fossil wood from Herne Bay—some

of the vessels of which contain large vesicular globes, which appear to have been freely floating within their parieties. They vary much in size, sometimes filling the vessel, at other times only one-tenth of its diameter. Mr. B. had never observed this structure before, either in recent or fossil wood, although he has frequently observed in fossil palms that they have apparently suffered so much from decomposition previous to fossilisation, that the cells have been disunited, and many of them had assumed a globular form; but in all these cases the globules were nearly uniform in size.

Craterium Pyriforme?—Mr. Quekett exhibited under the microscope this minute fungus, found on flint and other pebbles, in the gravel-pits of Old Ford, near Bow, Middlesex. It is not restricted to any one description of stone, nor yet adhering to every pebble, and principally if not exclusively on the side of the pit having a south-western aspect. The *fungi* appeared usually in minute cavities of the stone.

The Society then adjourned until Friday, 25th of November.

URANIAN SOCIETY.

On the Comet of 1264 *and* 1556. *Communicated by J. R. Hind, Esq., of Nottingham.*

In perusing the catalogue of Comets, I find the one in question appeared in February, March, and April, 1556, in the constellations *Libra, Virgo*, and *Bootes*. In 1264, during the summer, in *Hydra, Cancer, Gemini*, and *Orion*.

Another comet appeared in 975, in the months of August, September, and October, in the constellations *Hydra, Cancer*, and *Pegasus*, supposed to be identical with those of 1264 and 1556. Again, a comet was visible in 681, during November, and was seen seventeen days. Its position was in *Hercules* and *Aquila*. In September, 390, one appeared for thirty days, in *Gemini* and *Ursa-Major*. It does not seem to have been recognised during the two previous revolutions, but at the end of 481, B.C., we find recorded the positions of a comet in *Scorpio*. There is, however, in these data a slight irregularity of period, probably owing to the attractions of the larger planets; nevertheless, they afford ample testimony of the discovery of the comet during six revolutions of about 291¾ years.

I have fixed September 22·5849537, 1847, Greenwich mean time, as the period of the lower apsis. But the grand planetary equator has yet to be added; and I should not be surprised if the comet appears before September 1848.

ON THE PRINCIPLE OF ELECTRO-MAGNETICAL MACHINES.

In our report of the proceedings at the last meeting of the British Association for the advancement of science we gave a brief notice of Professor Jacobi's paper on electro-magnetical machines. A full and apparently authenticated report of the experiments made on this subject, with the Professor's opinions and deductions, was given in the *Athenæum* of last week, from which we now extract the most important parts:

"I have the honor to present the British Association an historical sketch of the laws which regulate the action of Electro-magnetic Machines, laws which will enable us to determine in a precise manner the important question, of the application of this remarkable force as a moving power. Since the commencement of my labors, which had partly a purely practical tendency, I proposed to myself to fill up as much as possible the blank which still remained in our knowledge of electro-magnetism. With the assistance of M. Lenz, I prosecuted the labors, which were the more arduous as they had but few precedents in the direction which I considered it necessary to follow, and we began to examine carefully the laws of electro-magnets. The report, which contains the results of our researches, was read in June 1838, before the Academy of Sciences at St. Petersburg. I take the liberty of repeating here, very briefly, the contents of this first report. The problem which we sought to determine may be stated as follows: If a nucleus of malleable iron and a voltaic battery of a certain surface is given, into what number of elements should this surface be divided? what should be the thickness of the wire of the helix which surrounds the nucleus? and, lastly, what number of turns should this helix have, in order to produce the greatest amount of magnetism? I take the liberty of appending to this statement the report in question, and will proceed to explain the particular laws: 1st. The amount of magnetism engendered in malleable iron by galvanic currents, is in proportion to the force of those currents. 2dly. The thickness of the wire twisted into a helix, and surrounding a rod of iron, is absolutely of no consequence, provided that the helix have the same number of turns, and the current be of the same force. This law extends also to the case in which ribbons of copper are employed instead of wire. Nevertheless I must notice, that in order to obtain a current of equal force, it is necessary to employ a voltaic apparatus of greater force, if small wires which offer a greater resistance are employed. 3dly. If the current remain the same, the influence which the diameter of the helix exercises may be neglected in the majority of practical cases. 4thly. The total action of the electro-magnetic helix upon the rod of iron, is equal to the sum of the effects produced by each coil separately. Adopting these laws, and submitting them to calculation according to the formula of M. Ohm, the importance of which formula has but lately begun to be appreciated by some British philosophers, we have established the formula which contains all the particular conditions required to obtain the maximum amount of magnetism, which may be expressed in the following extremely simple manner, viz. *the maximum of magnetism is always obtained when the total resistance of the conducting wire, which forms the helix, is equal to the total resistance of the pile.* On referring to the remarkable law of the definite action of the galvanic current, established by Mr. Faraday, it is found that the magnetism of malleable iron divided by the consumption of zinc,—a quantity which we have called economic effect—is with reference to the maximum of this magnetism, a constant, or an expression into which neither the thickness of the wire nor the number of the elements into which the total given surface of the battery is divided enters, but only the total thickness of the envelope.

"Having finished these first researches, and having obtained these results, which were highly satisfactory, not only for their simplicity, but also for their practical value, we set about extending our inquiries to iron rods of different dimensions. Is there, it may be asked, any specific effect produced by the length or thickness of the nucleus? or does the degree of magnetism solely depend upon the construction of the helix and the force of the current? We submitted nine cylinders of malleable iron, each eight inches in length, and of different diameters, from three inches down to one-third of an inch, to the action of a voltaic current of the same force in each case, and we obtained the amount of magnetic force represented in the following table.

Diameter of the rods.	Magnetism observed.	Magnetism calculated.
3	447	442
2½	378	376
2	308	310
1½	246	244
1	175	178
⅔	158	156
⅝	142	135
½	112	113
⅛	87	91

"This calculation has been made according to the formula $m = 131.75\ d.[-46.75$, in which the constants have been obtained by the method of the least squares. The differences between calculation and observation are not so large that they cannot be attributed to the inevitable errors of observation, and to circumstances inherent in the qualities of iron, &c. A similar agreement is found between other observations, which we shall describe in the report itself. I think, therefore, we may admit the following law, namely, that the *amount of magnetism received by different iron rods of the same length, and submitted to the influence of a current of the same force, is proportional to the diameter of the rods.* I must remark, that the constant which we have added in the formula depends upon the magnetic influence which the helix exercises, independently of the nucleus of iron which it encloses. The practical consequences which may be deduced from this remarkable law are of considerable importance. Among these, however, I will at present mention only the following. Having found that the amount of magnetism is proportional to the surface of the malleable iron, and taking into account the quantity of iron employed in the electro-magnets, it is ascertained that it is more advantageous to employ in the construction of electro-magnetic machines, rods of small instead of large dimensions; or rather hollow iron, in accordance with my own experiments of 1837, which are found in 'Taylor's Scientific Memoirs,' vol. ii. &c. I cannot pass over in silence the experiments of Professor Barlow, who, as is well known, proved a long time before that the induction of the terrestrial magnetism upon malleable iron, depends only upon the surfaces, and is almost independent of the thickness. In order to ascertain the law of electro-magnets of different lengths, M. Lenz and I undertook numerous and laborious observations, which were extended even to rods of thirteen feet in length, and keeping in view at the same time the determination of the particular distribution of magnetism in the rods. The following table contains the results of some observations made with rods of the same diameter, but of different lengths, covered with electro-magnetic helices, and influenced by a current of the same force. M being the magnetism of the extremities, and n the number of the coils of the helix, we have $\frac{M}{n} = r$, a formula according to which we may calculate the numbers contained in the third column. The numbers in the fourth column are deduced from a series of other observations, made with the same helix of 960 turns, which did not cover the whole length of the rods, but were collected at the extremities only, where they occupied a space of about two inches in length. The helices being the same in all the observations, it was only necessary to divide the magnetism of the extremities by 960, in order to find the numbers of this column.

Table of Experiments upon the Magnetic Forces of Rods of different lengths.

Length of the Rods.	Number of Coils.	Mean Value of One Coil, if the Helix occupies the whole length.	Mean Value of One Coil, if the Helix occupies only the extremities.
3′	946	7,334	7,560
2′.5	789	6,993	7,264
2	634	7,402	6,871
1.5	474	7,880	7,491
1	315	7,847	7,573
0.5	163	7,766	7,691
		7,537	7,408

"From these numbers, it will be seen that the influence of one coil of the helix is nearly the same for all the rods, and that their length does not exercise any specific influence. It is only in proportion to the number of the turns or revolutions, and to the force of the current, that the rods can acquire a greater or less amount of magnetism. The small rods even appear to have a slight advantage over large rods, since it has been found by experiments that the actual force of rods of three feet bears to that of rods of half a foot the ratio of seventy-three to seventy-seven. It is also found, that there is a gain of seventy-five to seventy-four when the whole

length of the rods is covered, instead of simply collecting the same number of coils around the extremities. In March 1839, M. Lenz and I presented to the Academy of Sciences at St. Petersburg, a report, which I shall present to the Association. It contains the result of the experiments by which we have been enabled to establish the remarkable law, *that the attraction of the electro-magnets is proportional to the square of the force of the galvanic current, to the influence of which the rods of iron are submitted.* This law is of the highest practical importance, as it serves for the basis of the whole theory of electro-magnetic machines.

"While these purely theoretical researches were in progress, I did not fail myself to enter directly upon the question of the practical application of electro-mgnetism. Unfortunately, I cannot here give the details either of the experiments which I have made upon a very large scale, or of the machines and apparatus of various kinds which I have constructed. The necessity of multiplying the facts or tangible results—a necessity the more urgent, because the practical applications of this force increased so very rapidly—this necessity, I say, has not allowed me time or leisure to digest and arrange them. I will, however, particularly notice the satisfactory results of the experiments made last year with a boat of twenty-eight feet in length and seven and a half feet in width, drawing 2¾ feet of water, and carryiug fourteen individuals, which was propelled upon the Neva at the rate of about three English miles in the hour. The machine, which occupied very little space, was set in motion by a battery of sixty-four pairs of platina plates, each having thirty-six square inches of surface, and charged according to the plan of Mr. Grove, with nitric and diluted sulphuric acid. Although these results may perhaps not satisfy the exaggerated expectations of some persons, it is to be remembered, that in the first year, namely, in 1838, this boat being put in motion by the same machine, and employing 320 pairs of plates, each of thirty-six square inches, and charged with sulphate of copper, only half this velocity was obtained. This enormous battery occupied considerable space, and the manipulation and the management of it was very troublesome. The judicious changes made in the distribution of the rods, in the construction of the commutator, and lastly, in the principles of the voltaic battery, have led to the successful result of the following year, 1839. We have gone thus on the Neva more than once, and during the whole day, partly with and partly against the stream, with a party of twelve or fourteen persons, and with a velocity not much less than that of the first invented steam-boat. I believe that more cannot be expected from a mechanical force, whose existence has only been known since 1834, when I made the first experiment at Königsberg, in Prussia, and only succeeded in lifting a weight of about twenty ounces, by this electro-magnetic power.

"I must, on the present occasion, confess frankly and without reserve, that hitherto the construction of electro-magnetic machines has been regulated in a great measure by mere trials; that even the machines constructed according to the indisputable laws established with regard to the statical effects of electro-magnets, have been found inefficient, as soon as we came to deal with motion. Being always accustomed to proceed in a legitimate manner, and feeling great regret at the irregular attempts which were being made everywhere, without any scientific foundation, this state of things appeared to me so unsatisfactory, that I could not but direct all my efforts to ascertain clearly the laws of these remarkable machines. I submit the formulæ relative to these laws, which appear to me to recommend themselves as much by their simplicity as by the natural manner in which they develope themselves.

"These laws are thus expressed in terms:—

"1st, The maximum of mechanical effect which may be obtained from a machine, is proportional to the square of the number of voltaic elements, multiplied by the square of the electro-motive force, and divided by the total resistance of the voltaic circuit. With reference to some other investigations, which I have made of voltaic combinations, and under similar conditions, the use of platinum and zinc, the resistance being the same, will produce an effect two or three times greater than the use of copper and zinc.

"2d, Neither the number of the coils of the helix which covers the rods, nor the diameter or the length of the rods themselves, has any influence upon the maximum of the power. It results, therefore, that neither by adding to the length or diameter of the rods, nor by employing a greater quantity of wire, can the power be increased. The number of coils, the dimensions of the rods, and the other constituent parts of an electro-magnetic machine, should be considered simply as occupying the range of the ordinary mechanisms which serve for the transmission or transformation of the velocity, without increasing the available power. So it would be possible to use, instead of the ordinary wheelwork, rods of greater or less length, or a greater or less quantity of wire, in order to establish between the force and the velocity the relation which the applications to manufacturing processes may require.

"3d, The mean attraction of the magnetic rods, or the pressure which the machine can exert, is proportional to the square of the current. This pressure is indicated by the galvanometer, which in this manner performs the function of the manometer of steam-engines.

"4th, The economic effect, *i. e.* the duty or the available power, divided by the consumption of zinc, is a constant quantity. I may here repeat, what I stated elsewhere, that by employing platinum instead of copper, the theoretical expenses may be reduced in the proportion of nearly 23 to 14.

"5th, The consumption of zinc, which takes place while the machine is at rest, and does no work at all, is double that which takes place while it is producing the maximum of power.

"I consider that there will not be much difficulty in determining with sufficient precision the duty of one pound of zinc, by its transformation into the sulphate, in the same manner that in the steam-engine the duty of one bushel of coal serves as a measure to estimate the effect of different combinations. The future use and application of electro-magnetic machines appears to me quite certain, especially as the mere materials and vague ideas which have hitherto prevailed in the construction of these machines, have now at length yielded to the precise and definite laws which are comformable to the general laws which nature is accustomed to observe with strictness, whenever the question of effects and their causes arises. In viewing on the one hand a chemical effect, and on the other a mechanical effect, the intermediate term scarcely presents itself at first. In the present case, it is magneto-electricity, the admirable discovery of Faraday, which we should consider as the regulating power, or, as it may he styled, the logic of electro-magnetic machines."

SCIENTIFIC MEMORANDA, AND NOTES ON ART.

Synopsis of the Contents of the British Museum.—The forty-second edition of the catalogue of contents, and the arrangements adopted at the present time in our National Museum, has just been issued to the public, for *one shilling*, containing 370 pages. It being without exception the cheapest work extant, as it combines a variety of useful and pleasing information, written to the comprehension of even the commonest mind, by men of acknowledged talent (the several keepers of the departments). In addition to which, there is appended at the end of the general remarks on every branch of science connected with natural history, lists of the genera, exhibiting the latest and most approved arrangement of the different classes of the animal kingdom, a desideratum until the present time not supplied in a condensed form to naturalists. We strongly recommend the public to visit this our National Museum, for since the opening of the new galleries, it must be admitted by all, to be "worthy of the British nation."

Adulteration of Olive Oil.—This oil being the most expensive, is the most exposed to adulteration by oils of a common kind. The oil that is generally used for this purpose, is the oil of poppies. But this fraud is very easily detected. The recent indefatigable exertion of M. Faure has afforded an undeniable test of olive oil. We are indebted for the following adaptation of the process to M. Poutet, a chemist at Marseilles:—One hundred parts of oil of olives (100 grammes) is put into a medicine phial of white glass; to this is added three parts (three grammes) of prepared hyponitric acid. This mixture is shaken from time to time for half an hour, and is then left to settle. If the oil of olives is pure, and prepared without heat, it will be quite solid in thirty-five minutes. If it is pure, but prepared by heat, it will not become solid in less time than sixty or sixty-five minutes. If there be any addition of oil of poppies, in the proportion of

A twentieth,	solidification will occur in	1 hour	30 minutes
A tenth,		2 ,,	25 ,,
A fifth,		4 ,,	65 ,,
A half,		26 ,,	36 ,,

Effects of Mushrooms on the Air.—According to Dr. Mariet, mushrooms produce very different effects upon atmospheric air from those occasioned by green plants under the same circumstances. The air is promptly vitiated, both by absorbing oxygen to form carbonic acid, at the expense of the vegetable carbon, or by the evolution of carbonic acid immediately formed: the effects appear to be the same both by day and night. If fresh mushrooms be kept in an atmosphere of pure oxygen gas, a large proportion of it disappears in a few hours. One portion combines with the carbon of the vegetable to form carbonic acid, and another is fixed in the plant, and is replaced by azotic gas disengaged from the mushrooms. When fresh mushrooms are placed for some hours in an atmosphere of azotic gas, they produce but little effect on it. A small quantity of carbonic acid is disengaged, and in some cases a little azotic is absorbed.—*Journal de Pharmacie.*

Distribution of Palms.—The distribution of 358 species of palms, with which we are at present acquainted, is as follows:—Europe contains 1; New Holland, 6; New Zealand, 1; Oceania, 2; Africa, 13; Asia, 131; and America, 198.—*Von Martius.*

Ice-Boat.—Mr. Ballard has presented to the Institution of Civil Engineers the description of an ice-boat; his principle of breaking ice consisting in forcing the ice upwards, instead of forcing it through horizontally, or by pressing it down. For this purpose, a frame coated with a sheet of iron, is laid over the front of the boat, with an inclination downward from the boat, the lower end being under the ice.

Discovery of Animal Remains at Raglan.—A quantity of very interesting animal remains were discovered at Raglan, on the 7th inst., by some men in the employ of O. A. Wyatt, Esq., of Troy House; they consist of the bones of various animals. They were all found within a limited area of 80 feet, on a farm in Raglan (formerly part of the castle domains), imbedded about five feet deep in an alluvial mould, most probably produced by the action of floods. The remains of a riven oak tree was in close contiguity to some of the bones, and from the black color of the wood it is supposed that the tree was at some former period struck by lightning, and that the animals, whose remains have been found, might have been seeking shelter beneath its branches when the electric fluid struck it. This supposition is strengthened by the fact, that two meteoric stones, one weighing about 12lbs., and the other about 2lbs., were found on the same spot. The remains consist of the femur (thigh bone) of a species of red deer; one of the vertebræ of ditto, a part of the cranium of the same, and also a humerus; a femur of a goat, a scapula and pair of horns of the same quadruped; a fallow deer's rib, and two fallow deer's crania, with the horns in a tolerably perfect state, the extremity of one of the small branches being curiously polished; part of the cranium of a dog, and the lower jaw bones of a horse and cow. There are also some other bones which cannot easily be made out, as they have lost their extremities. There can be little doubt that those bones have been buried for many years in the situation in which they were discovered, as no deer are recorded to have been kept at Raglan since the siege which took place in 1646. —*Monmouth Beacon.*

Salep.—Professor Lindley recently communicated to the Linnæan Society, "A Note upon the Anatomy of the Roots of Ophrydeæ," in which he shows that Salep, the prepared roots of certain Ophrydeæ, is not a substance consisting principally of starch, as is the common opinion among writers of the present day, but is composed of a balsamic-like matter organised in a peculiar manner. The author briefly explains the error of those who have considered Salep to consist chiefly of starch, by allusion to the mode of its preparation. The tubercles are first par-boiled, and then dried, the effect of which is to dissolve what starch exists in the cells surrounding the nodules. The dissolved starch flows over the surface of the nodules, from which when dried it is undistinguishable; and, consequently, when iodine is applied to Salep, the mass appears to become iodide of starch. If the nodules, however, after this action of iodine be removed, they are seen to retain their original vitreous lustre.—*An. Nat. Hist.*

Fire-Proof Cement.—The attention of the Lord Mayor was last week directed to the fire-proof cement, invented by Mr. Biggs, in a letter from that gentleman. It is stated that by the application of this cement to the ceilings of rooms, instead of the common plaster, it will prevent the flames communicating from one floor to another. There is certainly at present great want of attention paid to the prevention of destruction of houses by fire, and the proposed

remedy, if as efficacious as the experiments made with it seem to show, would be a most essential benefit.

Helfer, the German botanical traveller, has been murdered by the natives of the Andaman Islands. He was attacked, and shot in the head with an arrow, when he was collecting specimens.—*Athenæum.*

VARIETIES.

Churchyards of the Metropolis.—Enon Chapel. This building is situated about midway on the western side of Clement's Lane, Strand; it is surrounded on all sides by houses, crowded by inhabitants principally of the poorer class. The upper part of this building was opened for the purpose of public worship about 1823; it is separated from the lower part by a boarded floor; this is used as a burying-place, and is crowded at one end, even to the top of the ceiling, with dead. It is entered from the inside of the chapel by a trap-door; the rafters supporting the floor are not even covered with the usual defence—lath and plaster. Vast numbers of bodies, from 10,000 to 12,000, (not one of which has been placed in lead), have been deposited here in pits, dug for the purpose, the uppermost of which were covered only by a few inches of earth. A sewer runs angularly across this "burying-place." A few years ago, the commissioners of sewers, for some cause, interfered—and ultimately another arch was thrown over the old one: in this operation many bodies were disturbed and mutilated. Soon after interments were made a peculiarly long narrow black fly was observed to crawl out of many of the coffins; this insect, a product of the putrefaction of the bodies, was observed in the following season to be succeeded by another, which had the appearance of a common bug with wings. The children, who attended the Sunday School, held in *this chapel*, in which these insects were to be seen crawling and flying in vast numbers during the summer months, called them—"body bugs." The stench was frequently intolerable; one of my informants states, that he had a peculiar taste in his mouth during the time of worship, and that his handkerchief was so offensive that immediately upon his return home his wife used to place it in water. The parish authorities interfered upon the subject of poor rates, proposing to impose a mere nominal one if the place were closed: this was done for about 12 months. In defiance of opinion, however, it was again employed for the purposes of interment, and has been so used up to the present time. I am acquainted with many who have been seriously affected by exhalations from the vault, and who have left the place in consequence. Some months since, handbills were circulated in the neighborhood, "*requesting parents and others to send the children of the district to the Sunday School," held immediately over the masses of putrefaction in the vault beneath.* Residents about the spot, in warm and damp weather, have been much annoyed with a peculiarly disgusting smell; and occasionally, when a fire was lighted in a house abutting upon this building, an intolerable stench arose, which it was believed did not proceed from a drain. Vast numbers of rats infest the houses; and meat exposed to this atmosphere, after a few hours becomes putrid. This place is familiarly known among undertakers by the appellation of the "dust hole," and is a specimen of one of the evils which sprang up during the operation of certain laws that were hostile to the cultivation of anatomical science, which have happily now been repealed. The professed security of the dead was made the pretext: individual advantage was the real object for depositories of this description. The health and comforts of the living were entirely disregarded, and the annoyance and dangers resulting from the proximity and effluvia of decaying animal substances were submitted to and hazarded by survivors, rather than subject themselves to the tormenting anxieties which arise from the apprehensions of a brutal exhumation. I have several times visited this Golgotha—I was struck with the total disregard of decency exhibited,—numbers of coffins were piled in confusion—large quantities of bones were mixed with the earth, and lying upon the floor of this cellar (for vault it ought not to be called), lids of *coffins* might be trodden upon at almost every step.—*Gatherings from Grave-yards of London, by G. A. Walker, Surgeon.*

Cotton Manufacture in America.—The following statistical notice of the cotton manufacture of the State of Massachusetts in 1837, is compiled from the returns of the assessors in each county, by John P. Bigelow, secretary to the commonwealth, and given in a work recently published, entitled 'The Cotton Manufacture of Great Britain and America contrasted" by James Montgomery.

Number of mills	282
——— spindles	565,031
Pounds of cotton consumed annually	37,275,917
Yards of cloth manufactured annually	126,319,221
Value of cotton goods manufactured yearly (in dollars)	13,056,659
Males employed	4,997
Females employed	14,757
Capital invested in the cotton manufacture (in dollars)	14,369,719

To Prevent Insects Climbing up Fruit Trees.—At a late meeting of the Entmnological Society, Mr. J. H. Fennell communicated the following successful mode of preventing insects ascending the trunks of fruit-trees:—Let a piece of Indian rubber be burnt over a gallipot, into which it will gradually drop in the condition of a thick viscid juice, which state, it appears, it will always retain; for Mr. Fennell has, at the present time, some which has been melted for upwards of a year, and has been exposed to all weathers without undergoing the slightest change. Having melted the Indian rubber, let a piece of cord or worsted be smeared with it, and then tied several times round the trunk. The melted substance is so very sticky, that the insects will be prevented, and generally captured, in their attempts to pass over it. About three pennyworth of Indian rubber is sufficient for the protection of twenty ordinary sized fruit-trees.

American Industry.—Oliver Amen, of West Bridgewater, Massachusetts, commenced life by making a dozen shovels, which he took to market in a wagon. He now owns three extensive factories, at Easton, Braintree, and West Bridgewater, employs 90 workmen, and has four teams to carry his shovels to market. His profits are 20,000 dollars annually.

Coal Mine Accident.—On Friday Morning, an explosion of carburretted hydrogen gas occurred at the Farnacres colliery, near Newcastle-upon-Tyne, by which five people were killed. About half-past 12 o'clock, the banksman heard a noise in the pit, resembling (as he described it) a peal of thunder. He shouted to the men below, enquiring what had occurred; and receiving no reply he shouted again. There was still no answer. He then threw a stone into the pit, and perceived that it fell amongst water; and within two minutes of the time which he heard the loud noise, the pit (which is 20 fathoms deep) was filled with water to the top. There were five men in the workings, all of whom perished. The steam-engine, which is of 50-horse power, and pumps 60 gallons per minute, has been in operation from the time of the accident, yet without making the slightest impression upon the inundation. Conjectures as to the source of the flood are various. The pit had been "lain in" for some time, and was only lately reopened; and it is thought by some, that the water proceeds from the old workings. The wells of the neighborhood, which yielded a good supply on Thursday night, were found to be quite empty on Friday morning.

Collision of two Steam Ships.—The steam-ship Phœnix, which traded between London and Havre, was run down off Dungeness point, on Sunday evening, by the Britannia steam-ship, trading between the same ports, and was entirely lost. The Britannia's bow struck the Phœnix just before the paddle-box, on the starboard side, the weakest point of a steam-vessel, and cut her down to the water's edge. The Phœnix immediately began to fill. The boats of both vessels were lowered, and saved the whole of the passengers and crew of the Phœnix, who were taken on board the Britannia, and brought to London. The Phœnix went down in thirty-five fathoms water before the boats reached the Britannia, and is irrecoverably lost. Among the cargo were 250 casks of tallow, 15 tons of block tin, bale goods, and other property, worth at least £15,000. Two French gentlemen who were asleep in their cabins were aroused with some difficulty by George Dines, the steward of the Phœnix. The water had nearly reached the top of the saloon-table when Dines pulled them out of their berths and forced them on deck, when they learned the vessel was sinking, and before they had time to recover from their fright were lowered into a boat. The Britannia had her trysail and mainsail set when the collision took place, and the way she had on her, independent of the power of her engines, which were stopped before the collision happened, was sufficient to sink a vessel like the Phœnix There is no doubt the tallow in the hold of the latter vessel kept her afloat so long, and to this fortunate circumstance may be attributed the preservation of the people on board. The Phœnix was built at Havre, and was one of the most handsome steam-ships ever seen afloat. The Britannia is a much larger and stouter vessel than the Phœnix, and one of the most powerful of the fleet of steamers belonging to the General Steam Navigation Company.

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Clerk to the Company.

Company's office,
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HENRY FLOWER, Secretary.
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ACTS OF PARLIAMENT.

PATTERNS,—
27 Geo. III., c. 38; 2 Victoria, c. 13; 2 Victoria, c. 17. (The last relates to patterns and *models.*)

PATENTS FOR INVENTIONS,—
2 and 3 Victoria, c. 67.

SCULPTURES,—
38 Geo. III., c. 71.

ENGRAVINGS,—
7 Geo. III., c. 38; 17 Geo. III., c. 57.

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8 Anne, c. 19; 12 Geo. II. (Booksellers' Act), c. 36; 15 Geo. III. (Universities' Act), c. 53; 54 Geo. III. (General Copyright), c. 156.

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The HAGUE, for HOLLAND; BERLIN, for PRUSSIA; VIENNA, for the AUSTRIAN DOMINIONS; MUNICH, for BAVARIA; DRESDEN, for SAXONY; FRANKFORT, for the GERMAN UNION; ST. PETERSBURG, for RUSSIA, &c. &c. &c.

N.B. A Solicitor is in attendance, daily, from Eleven till Two o'Clock, who may be consulted on all points of PATENT LAW.

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THE

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AND JOURNAL OF INDUSTRY;

A WEEKLY BRITISH AND FOREIGN MISCELLANY OF

SCIENCE, INVENTIONS, MANUFACTURES, & ARTS.

No. 67.] SATURDAY, NOVEMBER 7, 1840. [PRICE FIVEPENCE STAMPED. CIRCULATING FREE BY POST.

MECHANICAL ADVANTAGES OF RAILWAYS.

It would be waste of time at the present day to dilate on the utility of railways. The simple fact that by their means the distant parts of the kingdom have been brought, in point of time, within one-third the distance of each other, is sufficient to prove the great practical advantage of this means of conveyance. The inconveniences, such as they are or are fancied to be, are more than adequately balanced by conveniences of other kinds, not experienced in common-road travelling; and the danger, which must necessarily more or less attend all modes of conveyance, has been hitherto—even in the infancy of the system, and with all the imperfections incident to novelty to contend with—practically shown to be much less than by stage-coach travelling.

Assuming then, as generally admitted, that great benefits have been derived, and that still greater advantages are likely to accrue, from carrying into general operation this great invention of modern times, we now propose to consider the subject in a scientific point of view, and to show the nature and extent of the mechanical advantages of railways compared with common roads.

The mechanical advantages are threefold. They consist, in the first place, in the level of the road; secondly, in the diminution of resistance by the smooth surface of the rails; and thirdly, in the employment of steam instead of animal power, for which such roads are peculiarly adapted.

A perfectly level road is, of itself, a very important acquisition in locomotion; especially when steam power is employed. This will be manifest when it is considered that on any incline the weight is not only to be *drawn* but to be *lifted*. When horse power is used, on common roads, an obstacle of this kind is not insurmountable, because an animal possesses the power of exerting additional strength for a limited time to overcome any temporary difficulty; and because, in the next place, the weight drawn is comparatively light, and may be lifted with proportionate ease. The ordinary obstructions of the road are so great, that its inclination, provided it be not too steep, makes not a great addition to the draught; for when the road is soft or rough, the whole weight of the carriage and load is actually lifted as well as drawn every foot of its progress, even on level ground. A great amount of power is thus continually lost on common roads in lifting the load; and a constant reserve of animal strength is necessary to overcome these difficulties. On a level well-laid railway, the only resistances to the motion of the carriages are, the friction of the axles, the slight resistance of the surface of the rails, and, when the speed is great or the wind blows adversely, the resistance of the air. It has been found by experiment that on a level railway a weight of nine pounds hanging over a pulley will draw one ton; but if the road be in the slightest degree inclined, a much greater force will be required, for it will then have to lift the load. Let us suppose the road were inclined one foot in 250. Such an incline would be imperceptible to the eye, but the effect on the draught would be this; the whole weight of the train would have to be raised one foot in traversing a distance of two hundred and fifty feet, and a corresponding power must be employed;—that is to say, in addition to the nine pounds necessary to overcome the resistance and friction, a power would be required bearing the same proportion to the load that the length of the inclined plane bears to its angle of elevation. Therefore, with an incline, or "gradient" as it is termed, of 1 in 250, the power to move one ton weight must be equal to the two hundred and fiftieth part of a ton, in addition to the force required to move it on a level. The power would in such a case require to be doubled, on an incline that could not be perceived by the eye.

The greater importance of having railroads level than common roads will be perceived from the following considerations of the advantages which railroads derive from the diminution of resistance, or, as it is commonly called, friction.

We have stated that a tractive power of nine pounds will move a ton weight on a level railway. To move the same weight on a level gravel road requires one hundred and fifty pounds. This, however, must vary with the state of the road, for in wet weather, when the road is soft, a much greater power would be necessary. We thus find, that the advantage of a level railway over a gravel road is more than sixteen to one on a level. But in an incline, the railway has no additional advantage in lifting the load than a common road; therefore, in proportion to the inclination its proportionate advantages diminish. In the case we have before instanced, the moving power on a railway required to be doubled when the gradient was only 1 in 250; but on a gravel road, the extra power required would be only one-sixteenth that before employed; for the nine pounds additional power required would have to be added to 150 instead of to only nine, as in the case of the railway. If the gradient be 1 in 100 the additional tractive power would be 22, which would be three times the force required for a level railway, whilst the 22lbs. added to 150lbs. would be little more than one-seventh additional on the gravel road.

Though a gravel road, with which we have compared railways, offers more resistance than roads made of other materials, yet taking into account the action of water, and the continual unevenness on the best of roads, the proportion of sixteen to one may be considered a fair average representation of the advantage which level railways have over level common roads. But the circumstance of railways being generally level, whilst common roads have great and frequent undulations, which make it necessary continually to lift up the load as well as to draw it along, gives the former great additional advantage over common roads, which amply repays the expenditure necessary for the levelling.

In a former article on friction,* we endeavored to show that the resistance to the motion of carriages on common roads, arising from obstructions, is distinct from friction, usually so called, inasmuch as there is no rubbing of the surfaces in the former case, and the resistance arises from the necessity of lifting the carriage and load over the obstructions. The whole, or nearly the whole, of this hindrance to motion is removed by railways; and of course a much lower power is required to move a given load. The hindrance to motion on level railways arises principally from the friction of the axles and the resistance of the air. They must therefore, under all possible circumstances, possess immense advantages over common roads; and were the latter to be so improved as to reduce materially the resistance from unevenness of surface, the undulations of the ground would prevent a corresponding degree of saving in power; for a quantity of power must always be had in reserve to lift the load up the inclines. It is this circumstance that presents an impediment to any available competition of steam-carriages on common roads, even allowing them to be greatly improved on their present construction. A complete change

* Inventors' Advocate, No. 31.

would be required, also, in the regulation of the roads, or roads must be made exclusively for them, before they could come into general use. We have, indeed, been propelled in a steam-carriage, up hill and over rough ground, at the rate of twenty miles an hour, but this was accomplished with an enormous sacrifice of steam, and with great danger from the carriages and animals on the road. Railroads, on the contrary, present peculiar facilities for the employment of steam power with safety and economy. Great as are the improvements already effected in the transit of goods and passengers by this means, we have no doubt that additional experience and the continued application of mechanical skill, will ere long render the conveyance by locomotive steam-engines on railroads much safer, more expeditious and economical than at present.

IMPROVEMENTS IN STEAM NAVIGATION.

At the sitting of the French Academy of Sciences on the 26th Oct., the attention of the meeting was devoted to the discussion of a maritime and military question of great importance. The sound of war seemed to have penetrated the hall of Minerva; and though the learned academicians appeared to treat the question as one belonging to science, it was evident their thoughts were bent on war. The subject of discussion was a new mode of propelling steam-ships proposed by M. Jouffroi, the son of the man for whom the French claim the honor of being the original inventor of steam navigation. Long before the American engineer Fulton made his first experiments in propelling vessels by steam it is asserted that M. Jouffroi the elder had successfully attempted to move a large vessel by the application of the same power on the river Saone. We translate from the report of the proceedings of the Academy the following account of the claims of the elder Jouffroi, and of the invention of his son.

In 1775 the waters of a river in France were first ploughed by means of that powerful agent whose application to steam navigation was destined to become first known across the Atlantic. Judging from the report presented to the Academy, the priority of Jouffroi, with respect to that invention previously, appears incontestibly established. It was, then, by a Frenchman, that the first steam-vessel was constructed; it was also another Frenchman who prepared the first engine for raising the water that was put in motion by this irresistible agent.

The fame of Jouffroi reflects even more honor on France than that of Denis Papin It is in fact a difficult question to determine what kind of compensation can be made by the French nation to that illustrious philosopher whose whole family was banished from France by the revocation of the edict of Nantes, and who himself died at a distance from his country, in consequence of the measures of the implacable Jesuits, who directed the conscience of Louis XIV.

The son of the first inventor of steam vessels has wished to continue and extend the glorious work of his father, and he has endeavored to effect a total revolution in the existing state of steam propulsion of ships, both in those of armed vessels as well as merchantmen. Such is the undertaking which was on the 26th October discussed before the Academy of Science.

M. A de Jouffroi, while endeavoring to establish the claims of his father in the memoir presented to the institution, advanced opinions of his own which were quite at variance with the usual method of building steam-vessels. He announced that he was quite prepared to afford practical and demonstrative trials before a commission of the Academy. The trials have been made and examined, and M. Cauchy read the report of them.

M. Cauchy commenced by briefly stating the nature of the improvement proposed by M. Jouffroi. It principally consists in a new disposition of the moving power.

The paddle-wheels of steam vessels have been attended with inconveniences, that from their commencement have been perceived by all able engineers. Their position is still subject to many objections, and they are now placed in the middle only as a *pis aller* for want of a better place. Besides, these wheels would usually be exposed to the fire of the enemy in case of a naval engagement; they are also subject to a yet more serious objection founded on a total disregard of all the laws of mechanics. M. Cauchy stated that the most serious inconvenience arising from the paddle-wheels of steam ships generally employed arose from the impossibility of giving them a surface proportionate to the repulsive force desired to be obtained. Hitherto in the largest steam-ships they have been unable to allow the surface of a paddle to exceed two square metres. Besides, the plunging paddle does not produce its total effect until it is entirely raised from the water, and in many positions a great part of the power is wasted in raising the water and not in propelling.

The object of the mechanism employed by M. de Jouffroi is to obviate this inconvenience. Two immense paddles are placed at the stern of the vessel, in the shape of swans' feet, which close when the vessel is impelled, and open when the impulse is to be given; this method admits the power of increasing the surface of these impelling paddles to an almost unlimited degree.

The committee have made actual experiments of the apparatus on the water of the Seine.

M. Cauchy first spoke of the model of a *frigate* as having been employed; this excited general astonishment: but the experiments on the Seine became immediately intelligible when it was understood that this *frigate* was little more than a metre and a half long. This pretty model was in fact propelled, and to the approbation of the committee, sometimes with paddle-wheels or according to the usual system, sometimes by means of the enlarged surfaces. The committee have done every thing that could be done with this miniature frigate; they examined and compared in succession the effect of wheels and the new plan, and the general conclusion arrived at with respect to this small model, was, that though the impelling power in the two plans was nearly equal, there was, notwithstanding, a very considerable advantage in favor of the new one, because after the propellers were stopped they imparted considerable motion to the little model. Thus in one of the experiments the usual paddle-wheels and the swans' feet apparatus, in performing a hundred and eighty-two revolutions, drew the small frigate in eight minutes over a space of fifty-two metres and sixty metres, at the end of which the paddle wheels had exhausted their efforts, but the swans' feet apparatus, besides gaining eight metres, carried the little vessel sixty metres farther in sixteen minutes. This power so actively displayed should be doubtless attributed to the new propellers. We will not continue these comparisons farther than is necessary to arrive at the delicate part of our task, which consists in stating that all these experiments to which M. Cauchy has so earnestly devoted himself prove absolutely nothing. This was the impression produced also on the Academy. It will scarcely be imagined that a committee, formed of a majority of practical engineers, having considered the question philosophically, could for a moment imagine that any thing could be judged of from experiments made by a model not larger than a metre and a half. The uncertainty is too flagrant, and the judgment of the committee must have been strangely perverted.

MARSH'S APPARATUS FOR DETECTING ARSENIC.

The recent trial of Madame Laffarge at Tulle, for the murder of her husband by administering arsenic, has given rise to much angry discussion among the French chemists, owing to the different results arrived at by those employed to analyse the decomposed remains of the deceased. M. Raspail denies the correctness of the experiments made by M. Orfila, who detected arsenic in every part of the putrid mass submitted to experiment. It seems, indeed, admitted that the delicacy of the test for arsenic afforded by Marsh's process is liable to cause dangerous inferences from its power of detecting the most minute particles of the poison; and as it is now found that the human body always contains a minute portion of arsenic, the effect of any analysis so refined may induce the belief that the cause of death is the poison inherent in the human frame. These discoveries and discussions have caused attention to be more directed towards Marsh's apparatus, and suggestions to be made for the improvement of it.

The process itself consists essentially in making hydrogen gas, in the ordinary gas apparatus, from the solution suspected to contain arsenic. If arsenic really exist in the liquid, it will combine with the hydrogen produced, so as to form arseniuretted hydrogen gas. This gas is burned as it issues from a tube fitted to the vessel in which it is produced, and by receiving this flame on earthenware plates, small quantities of arsenic are collected, spread over the surface in bright metallic spots, the nature of which can be determined by the usual tests; that is, by nitric acid, which converts metallic arsenic into arsenic acid; then with the nitrate of silver, which forms with it an arseniate of silver, of red brick color.

This process is simple, but it is attended with several inconveniences. If the gas be inflamed too soon there is the risk of detonation, and the vessel will be broken to pieces. A large quantity of the arseniuretted hydrogen is lost at the same time. If the ignition be deferred, so as to avoid the risk of explosion, a portion of the arsenic may escape. In short, it becomes difficult to perform the operation so as to obtain the arsenical spots, notwithstanding the presence in the liquid of even a large quantity of arsenic; though the process will detect the most minute quantities, if rightly managed. Those who have performed the experiments know that the angle at which the plate is held to receive the flame, and the size of the flame itself, cause the results to vary, and nothing certain has been fixed, either as regards the degree of inclination or the size of the flame. To remove these causes of error, M. Lassaigne proposed to make the gas pass though a solution of pure nitrate of silver. The arseniuretted hydrogen gas mixed with the hydrogen is then decomposed by degrees by the nitrate. The silver is precipitated in black flakes. There is produced arsenious acid mixed with the excess of nitrate of silver. This excess of nitrate of silver is decomposed by chloriodic acid; it is thus converted into a chloride; it is filtered, and the chloride and the metallic silver are separated from it. The filtered liquor is heated; the nitric acid which it contains re-acts on the arsenious acid and converts it into arsenic acid; the properties of which are ascertained by the ordinary means. M. Lassaigne is of opinion that this process would detect one milligramme of arsenious acid dissolved in a thousand grammes of water; that is, in the proportion of one-millionth part, or of about one grain of arsenious acid in 18 gallons of water.

Some objections have been raised against the process of analysis by Marsh's apparatus; one of which is founded on the multiplicity of the operations necessary to discover such small quantities of arsenic. But the strongest objection, if well

founded, proceed from M. Raspail, who asserts that the nitrate of silver is as uncertain a test of arsenic as sulphuretted hydrogen, and that the red brick color may be obtained by means of that nitrate on other metallic spots produced by Marsh's process, which have all the appearance of arsenic, though they contain not an atom of that metal. The acetate of iron, mixed with a phosphate, especially with an iodide, will, according to M. Raspail, produce these false appearances of arsenic. Besides, he affirms that the red color is of so many different shades that it can only mislead.

M. Raspail, after having endeavored to detract from the value of nitrate of silver as a test of arsenic, proceeds to examine the process of M. Lassaigne, which he thinks equally fallible with the other. But in order to show the uncertainty of Marsh's apparatus, it must be proved that any other metallic spots produced thereby, besides arsenic, can be volatilised at a low degree of heat, easily dissolved in nitric acid, and are colored red by nitrate of silver. This M. Raspail has failed to do.

The doubt, however, which exists respecting the application of the process in the trial of Madame Laffarge does not depend on the nature of the metallic spots, but merely as to the source whence such small quantities of arsenic as were found came. With a view to establish more satisfactorily the results of the analysis made at Tulle, M. Orfila has been instituting fresh experiments in Paris before a commission appointed by the Academy of Medicine, for the purpose of showing the action of arsenic on the body of animals, and the mode of detecting it after death. Two dogs were killed at the same time, one by arsenic and the other by hanging. On examining their bodies twenty-four hours after death, the urine of the poisoned dog exhibited manifest indications of arsenic by Marsh's apparatus, whilst that of the other dog exhibited no trace of it. Portions of the liver of the two dogs were submitted to the test of Marsh's apparatus, with similar results; in the liver of the one which was hanged no arsenic was detected, whilst the liver of the poisoned animal gave decided evidence of its presence. M. Orfila has determined in the course of his experiments, that arsenic when taken in quantities not sufficient to produce death is quickly carried from the system by the urine, and therefore he concludes that it is indispensible in the treatment of persons who have taken arsenic to favor the secretion of urine as much as possible.

ENGLISH EXPIRED PATENTS.

BENJAMIN NEWARCH, of Cheltenham, *improvements in fire arms*, Nov. 7.

SPECIFICATIONS.

ENTERED AT THE ENROLLMENT OFFICE.

(*Continued from page* 276.)

WILLIAM CRANE WILKINS, of Long Acre, Middlesex, lamp manufacturer, and MATTHEW SAMUEL KENDRICK, same place, lamp manufacturer, *certain improvements in lighting and in lamps*, Oct. 26.—Claim first —A peculiar construction of argand lamps, by which the cotton is raised or lowered without the usual application of racks and pinions, with a burner of a lighter form and make, and the application of atmospheric air in a more approved manner, by means of glass chimneys of various shapes.

The oil cup is connected by a ring with an inner tube, which has a spiral groove passing round it; the outer tube has two pieces of metal on the inside, forming a perpendicular groove; the cotton holder has its outer pin working in this groove, and its inner pin working in the spiral groove round the inner tube, so that on turning the ring which connects the inner tube and the oil cup, the cotton will be raised or lowered, and by this arrangement the use of racks and pinions is done away, and the burner may therefore be made smaller and lighter. There are seven different forms of chimneys which act much in the same manner, viz. allowing the air to enter at the bottom, when it is gradually compressed as it approaches the flame.

Claim second.—An improved method of supplying wall lamps with oil.

The lamps are constructed with two reservoirs for oil, one above the other, and an air chamber placed beneath the lower one; the lower reservoir is first filled with oil, and then the upper one; when the oil in the lower one is consumed, a cap in the upper one, which commands a valve, is opened, and the oil contained therein passes through a pipe into the air chamber, and up through a second pipe to the bottom of the lower reservoir, and thence in a steady supply to the main pipe of the burner.

Claim third.—Mode of constructing concentric wick lamps.

This is by having the circle that holds the wicks made of iron, and in one piece, instead of tin turned over, whereby all risk of breakage is avoided. The bottom part of the cotton holders of these lamps is furnished with vertical rods and screw nuts, by which the wicks are raised or lowered.

Claim fourth.—Mode of applying perforated diaphrams to the barrels of gas burners.

One or more of these are applied inside the barrel, near the point of ignition where the gas is most likely to surge, and has the effect of delivering the gas in a circuitous form, thereby imparting a steadiness to the light.

Claim fifth.—Mode of applying signal lights for steam-boats, railroads, and other purposes.

A lamp with a white chimney is enclosed in a reflector, and gimbled to a pole. Above this a lamp with a red glass chimney, and enclosed in a reflector, is also gimbled—the pole is weighted at one end to keep it with the lamps perpendicular when at rest, and turns on an axis, so that by pulling a cord attached to the outer lamp the pole and red light is swung round to any position required, the white light remaining in the centre.

Claim sixth.—Mode of applying moveable circular lenses to lamps, for signals.

These lenses are of colored glass, and are made to slide over the glass chimney, and may be of any color, and by their form admit of being quickly changed.

ORLANDO JONES, of City Road, Middlesex, accountant, *improvements in treating or operating on farinaceous matters to obtain starch and other products used in manufacturing starch*, Oct. 30.—Claim first. —Mode of treating or operating on farinaceous matters by an alkaline solution for the purpose of obtaining starch, and other products, especially flour from rice, as hereafter described.

Claim second.—Mode of manufacturing starch from rice, as hereafter described.

Caustic soda or potash is diluted with water, until the solution contains two hundred grains of real soda or potash to every gallon of water. A number of vessels are provided as follows: No. 1, one or more vessels of iron, tin, copper-tinned, or stone-ware, for the purpose of containing the rice with the alkaline solution during the process of maceration: No. 2, one or more vessels of iron-tinned, or copper-tinned, or stone-ware, for holding the rice-flour and the alkaline solution: No. 3, one or more vessels of wood for the purpose of holding the products of starch when drawn off from No. 2: No. 4, one or more vessels of wood for containing the alkaline solution when drawn off from the rice: No. 5, one or more vessels of wood for holding the water used for washing the rice from the alkaline solution. To fifty gallons of the above solution about one hundred pounds of rice is added, and the whole is placed in vessel No. 1, and left for twenty-four hours for the purpose of macerating the rice. The solution is then drawn off into vessel No. 4, and water added to the rice in twice the quantity of the solution drawn off, to clean it from the alkali. After the rice has been well washed, the water is drawn off by means of a tinned syphon into vessel No. 5. The rice is then placed in a sieve to drain. When it is dry it is ground or crushed by mill-stones or other proper apparatus, and the flour placed in vessel No. 2, and to each pound of flour one gallon of the alkaline solution is added, and also the deposits from the liquid in No. 4; the whole is then stirred for twenty-four hours, and then left to rest for seventy hours, when the liquid will be of a yellow-brownish color; this is to be drawn off, and water in twice the quantity added to cleanse the flour, when the separate deposits will begin to take place. The starch will not sink so readily as the other matters, but will be suspended at the top, and the other and heavier matters will sink to the bottom. The starch with the liquid is then to be drawn off carefully into vessel No. 3, and allowed to settle, when the water is to be drawn off from the starch, which is then dried and operated on in the usual manner. This method will produce the best starch; but an inferior kind may be made by using the whole of the deposits from vessel No. 2, stirred together, instead of abstracting the finer portions. The mode of extracting the gluten, is by adding to the alkaline solution drawn from the rice flour sulphuric acid in a sufficient quantity to neutralise the alkali, when the liquid is drawn off and the deposits reduced to flour, which may be used in making biscuit, and for other purposes of food.

JOHN INKSON, of Ryder-street, St. James's, *improvements in apparatus for consuming gas, for the purposes of light*, Oct. 27, being a communication from a foreigner residing abroad. These improvements consist in such an arrangement of parts, that a certain supply of gas may be allowed to each burner, and in such a manner that the flame is not altered by turning off other burners, &c.

A chamber is formed in the gas pipe near the burner, in which is fitted a piece of tube, like a cylinder open at one end. Through the centre of the closed end a hollow screw passes, near the end of which is suspended a valve inside the chamber. On a rush of gas this valve is forced against the end of the hollow screw and the vent is closed in the same degree, and thereby the current will be preserved the same as before; the supply is to be regulated by turning the hollow screw nearer to or further from the suspended valve. Another mode is by a simple arrangement of a rod working in stationary bearings, and to which is attached a light spiral spring in such a manner that on a rush of gas the spring is extended and the head of the rod partially stops the aperture of the pipe, and on the rush of gas ceasing the spring contracts, draws back the rod, and re-opens the valve.

The claim is not for any of the separate parts, but for the arrangement producing the above effects.

NOTICE.

In accordance with the determination expressed in our 26th Number, of giving one month's clear notice to Inventors, before publishing their specifications, we hereby inform the following Patentees, that their specifications will be published in the "INVENTORS' ADVOCATE" of Dec. 19. Each party will receive, in addition, a *private* communication to the same effect.

Samuel Wagstaff Smith, of Leamington, iron-founder, due Dec. 9.
Robert Hampson, of Mayfield Print-works, Manchester, calico-printer, due Dec. 9.
Alexander Southwood Stoker, of Birmingham, due Dec. 9.
Christopher Nickels, of York-road, Lambeth, due Dec. 9.
Thomas Edmondson, of Manchester, due Dec. 9.
John George Shuttleworth, of Freamley-place, Sheffield, due Dec. 9.
Francis Greaves, of Radforth-street, Sheffield, due Dec. 11.
William Lance, of George-yard, Lombard-street, due Dec. 11.
Benjamin Winkles, of Northampton-street, Islington, due Dec. 11.
Joseph Wolverson, of Willenhall, Staffordshire, and William Rawlett, same place, due Dec. 13,

Ezra Jenks Coates, of Bread-street, Cheapside, due Dec. 13.
Edward John Carpenter, of Toft Monks, Norfolk, due Dec. 13.
Richard Beard, of Egremont-place, New Road, due Dec. 13.

PATENTS NOT SPECIFIED.

(Concluded from our last Number.)

William Morritt Williams, of Bedford-place, Commercial-road, for *an improved lock and key*,—due Dec. 1, 1839.

Charles Rober, of Leadenhall-street, for *improvements in fixing color in cloth*,—due Dec. 19.

James Yates, of Effingham Works, Rotherham, iron-founder, *improvements in the construction of cupola furnaces for melting metals*,—due Jan. 13. 1840.

John Hanson, of Rasheliffe, York, patent lead pipe manufacturer, for *certain improved apparatus for measuring and registering the quantity of gas, water, or other fluid, passed through the same*,—due Jan. 24.

James Kay, of Pendleton, of an extension for the term of three years, for *a new and improved machinery for preparing and spinning flax, hemp, and other fibrous substances by power*,—due Jan. 26.

Samuel Sydney Smith, of Suffolk-place, Hackney-road, for *certain improvements in machinery for raising water*,—due Feb. 1.

Robert Varicas, of Burton-crescent, Middlesex, for *improvements in rendering fabrics and leather waterproof*,—due Feb. 10.

Thomas Edmonson, of Manchester, for *certain improvements in printing presses*,—due May 9.

Arthur Collier, of Stoke, for *improvements in pumps*,—due May 25.

Henry Dunington, of Nottingham, for *improvements in machinery employed in making frame-work knitt or stocking fabrics*,—due June 2.

George Wilson, of Salford, for *certain improvements in steam whistles adapted for locomotive engines, boilers, and other purposes*,—due June 16.

George Lindsay Young, of Hackney, for *an improved surface for paper, mill or card-board, vellum*,—due June 21.

John Cutts and Thomas Spencer, both of Manchester, for *certain improvements in machinery or apparatus for making wire cards for carding cotton, silk, wool, and other fibrous substances*,—due June 21.

Jean Francis Victor Fabien, of King William-street, London, *improvements in pumps*,—due July 7.

William Coltman, of Leicester, frame-smith, and Joseph Wale, of the same place, frame-smith, *improvements in machinery employed in making frame-work knitting, or stocking fabrics*,—due July 21.

James Bingham, of Sheffield, manufacturer, and John Amory Boden, same place, manufacturer, *certain improved compositions made to resemble ivory, bone, horn, mother-of-pearl, and other substances applicable to the manufacture of handles for knives, forks, and razors, pianoforte keys, snuff-boxes, and various other articles*,—due July 25.

Joseph Clarke, of Boston, printer, *improvements in pianofortes*,—due Aug. 14.

Charles Alexander Petterin, of Leicester-square, *improvements in wind and stringed musical instruments*,—due Sept. 4.

Robert Varicas, of Burton-crescent, *improvements in rendering fabrics and leather waterproof*,—due Sept. 10.

Moses Poole, of Lincoln's-Inn, *improvements in producing and preparing leys for soap-making and in the manufacture of soap*,—due Sept. 17.

Elliaman Bicknell, of Newington-butts, merchant, *improvements in separating the solid from the liquid parts of tallow, and other fatty matters*,—due Sept 25.

Alexander Southwood Stocker, of Birmingham, manufacturer, *certain improvements in manufacturing tubing or tubes which are applicable to gas and other purposes*,—due Sept. 27.

Henry Kirk, of Upper Norton-street, Poland-place, merchant, *improvements in the application of a substance or composition as a substitute for ice for skating and sliding purposes, part of which improvements may also be employed in the manufacture of ornamental slabs and mouldings*,—due Sept. 28.

Claude Joseph Edmee Chaudron Junot, of Brewer-street, Golden-square, operative chemist, *certain improved processes for purifying, and also for solidifying, tallow, grease, oils, and oleaginous substances*,—due Sept. 30.

Louis August de St. Sylvian Baron de Los Balles, of Nottingham-street, Marylebone, *certain improvements for cleansing, decorticating, purifying, and preserving corn and other grain*,—due Oct. 15.

William Henry Bailey Webster, surgeon, R.N., *improvements in preparing skins and other animal matters for the purpose of tanning and in the manufacture of gelatine*,—due Oct. 15.

Jonathan Sparke, of Langley-mills, Northumberland, agent, *certain improved processes or operations for smelting lead ores*,—due Oct. 23.

FOREIGN PATENTS.—FRANCE.

SECOND QUARTER OF 1839.

(Continued from p. 164.)

No. 1. Aubrun, N. M. B., and Herr, G. A., represented by Perpigna, 5 years, for *a new method of suspending timber-work for roofs*, April 6, 1839.

2. Bonnié, B., 5 years, for *a sofa-bedstead*, April 6, 1839.

3. Brioude, A. A. V., and Messaud, H. N., 5 years, for *an anti-friction grease for carriages, mills, factories, railroads, and machinery*, April 6, 1839.

4. Clerx, J. J., 5 years, for *boots and shoes with elastic soles and upper leathers*, April 6, 1839.

5. Coursier, P., 5 years, for *a printing press, applicable to lithography, zincography, autography, copper-plate engraving, &c.*, April 6, 1839.

6. Domingue, L. A., and Boudet, F. H., addition to patent for 15 years, dated Dec. 5, 1838, for *a chemical process to prepare skins to be tanned or tawed*, April 6, 1839.

7. Fau, François, and Bernadue Delarbre, 5 years, for *a process of water-proofing woollen, cotton, hemp, and flaxen stuffs, and other tissues or felts, without preventing the passage of air*, April 6, 1839.

8. Gervais, M. F. M., represented by Perpigna, 15 years, for *a locomotive engine for digging canals and forming embankments for railroads and other purposes*, April 6, 1839.

9. Lefebvre, S., addition to patent for 5 years, dated Nov. 18, 1837, for *a new ladder to be used in cases of fire*, April 6, 1839.

10. Labarthe, C., second addition to patent for 15 years, dated Oct. 30, 1838, for *applying to the manufacture of paper, felt hats, and various fabrics, a new substance called "cortèsme," found in bark and in several land and marine plants, and for the mode of obtaining the same*, April 6, 1839.

11. Laranza, A. G., 15 years, for *mechanical means of making tacks and shoe-nails*, April 6, 1839.

12. Lefranc, P. B., 15 years, for *building by casing, both foundation and elevation of walls, piers, pillars, railings, &c.*, April 6, 1839.

13. Mallet, A., 5 years, for *a new bascule balance, graduated from one to twenty*, April 6, 1839.

14. Mesnard, E., 5 years, for *a new system of advertising*, April 6, 1839.

15. Miallet, G., 5 years, for *a regulating plane with pincers adapted to the manufacture of velvets*, April 6, 1839.

16. Miles Berry, represented by Perpigna, 15 years, for *certain improved apparatus for making soap*, April 6, 1839.

17. Oberwarth, L., and Co., 5 years, for *a refreshing and purifying coffee*, April 6, 1839.

18. Roux, M., ninth addition to patent for 15 years, dated April 27, 1838, for *the composition of a vegeto-mineral bitumen*, April 6, 1839.

19. Benoist, P. G., 5 years, for *an apparatus for preparing the wicks of candles*, April 11, 1839.

20. Dubose Brothers, 5 years, for *a mechanical Jacquard frame for the purpose of weaving, without the aid of experienced workmen, figured stuffs in wool, silk, and other substances*, April 11, 1839.

21. Dumouthier, J. C., and Guille, F., 5 years, for *scissors with steel blades, and white metal bows*, April 11, 1839.

22. Durios, P. O., addition to patent for 15 years, dated Sept. 5, 1838, for *processes for rendering stuffs and papers fire-proof*, April 11, 1839.

23. Grenier, A., addition to patent for 5 years, dated Oct. 23, 1838, for *a paper-cutting machine*, April 11, 1839.

24. Hemet Brothers, M. D. and C., addition to patent for 10 years, dated July 17, 1837, for *a new machine for printing stuffs and colored paper by means of cylinders of wood cut in relief*, April 11, 1839.

25. Mazeron, S., addition to patent for 15 years, dated July 11, 1838, for *an inlaid floor done by machinery*, April 11, 1839.

26. Poole, M., represented by Truffant, 10 years, for *various improvements in the construction of astral lamps, and of shades*, April 11, 1839.

27. Ricord, A., addition to patent for 15 years, dated Oct. 23, 1838, for *an axle-tree with guard wheels*, April 11, 1839.

28. Rollin, A., and Peudecœur, T., represented by Perpigna, 5 years, for *a new fastening for doors and windows*, April 11, 1839.

29. Cabeu, F., 5 years, for *a new lamp*, April 15, 1839.

30. Comte de Castelet, A., represented by Odde, 5 years, for *an effervescing lemonade*, April 15, 1839.

31. Galy Cazalat, A., 5 years, for *an apparatus for drying marshes, and rendering harbours healthy*, April 15, 1839.

32. Ladeuze, J. B. E., and Simyan, a second addition to patent for 10 years, dated June 6, 1838, for *an apparatus for quickly whitening lump sugar by means of compressed atmospheric air*, April 15, 1839.

33. Moreau, P., 5 years, for *a new mode of binding books and ledgers in boards and with hinges*, April 15, 1839.

34. Bordas, F., represented by Reynaud, 5 years, for *a new kind of mechanical hats*, April 17, 1839.

35. Lindsay Ormsby, J., addition to patent for 10 years, dated Nov. 24, 1838, for *improvements in window blinds*, April 17, 1839.

36. Marchand, A., and Carbon, C. F., addition to patent for 10 years, dated Aug. 11, 1838, for *a mechanical flail for threshing corn*, April 17, 1839.

37. Paulin, G. C. G., addition to patent for 5 years, dated July 22, 1837, for *an anti-mephitic apparatus, and its application to the manufacturing arts*, April 17, 1839.

38. Peyrels, B. A., 5 years, for *a new lady saddle*, April 17, 1839.

39. Aubert, P. G. V., 5 years, for *a new beverag composed of the juice of the most delicate fruits* April 25, 1839.

10. Chauvin, A. E. C., a second addition to patent for 10 years, dated March 20, 1838, fo

means of preventing accidents with fire-arms, April 25, 1839.

41. Coquard, P., second addition to patent for 10 years, for *a means of bleaching the leaf, stem, and root of the maize, for the manufacture of paper*, April 25, 1839.

42. Demarest, P., 15 years, for *machines for extracting turf*, April 25, 1839.

FOREIGN PATENTS.—BELGIUM.

LIST OF PATENTS RECENTLY GRANTED BY THE BELGIAN GOVERNMENT.

(*Continued from No. 66.*)

Arnould Voyave, of Brussels, rue des Bateaux, No. 56, a patent of invention for 15 years, for *a new copper apparatus for heating green-houses and apartments by means of hot water*, Oct. 12, 1840.

H. A. E. Ode, of Brussels, Boulevard de Waterloo, No. 34, a patent of invention for 10 years, for *a new method for abridging the study of arithmetic*, Oct. 12, 1840.

T. J. J. Fafchamps, of St. Josse-ten-noode, rue du Meridien, No. 318, a patent of invention for 15 years, for *a process of making bolts for railroads*, Oct. 12, 1840.

Andre Shanks, represented by Vanderlinden, of Brussels, Montagne du Pare, No. 2, a patent of invention for 10 years, for *a new tubulated shuttle for spinning cotton, silk, wool, and other fibrous substances*, Oct. 12, 1840.

S. L. Lemaitieu, of Brussels, impasse de la Violette, No. 1, a patent of importation for 5 years, to date from Aug. 22, 1839, for *an umbrella walking-stick*, Oct. 12, 1840.

J. C. Huart, of Brussels, rue de la Pepiniere, No. 19, a patent of importation for 5 years, to date from June 1, 1840, for *a process of effecting the entire combustion of gaseous and other bodies, by means of a ventilator*, Sept. 15, 1840.

A. L. Toussaint, of Brussels, rue de l'Arbre, No. 1, a pateut of invention for 10 years, for *a fire-proof iron safe with secret lock*, Oct. 14, 1840.

E. M. G. Dam, of Brussels, Marché-aux-herbes, No. 62, a patent of invention for 15 years, for *a new method of making common, fine, and superfine paper*, Oct. 14, 1840.

John Jackson, of Manchester, represented by Urling, of St. Josse-ten-Noode, rue des Arts, No. 139, a patent of invention for 10 years, for *improvements in making nails, nuts, bolts, and rivets*, Oct. 15, 1840.

Charles Marcelis, and V. Duval, of Liege, rue derriere St. Jacques, No. 483, a patent of invention for 15 years, for *a cast-iron mechanical window frame*, Oct. 15, 1840.

Sommerville Beckhaus, of Birmingham, represented at Brussels, by Huart, rue de la Pepiniere, No. 19, a patent of importation for 5 years, for *improvements in hinges*, Oct. 15, 1840.

Gachard, of Brussels, rue de la Paille, No. 14, a patent of importation and addition for 5 years, for *mechanical systems of embanking on roads and canals*, Oct. 15, 1840.

Henry Pinkus, of London, represented by Dixon of Brussels, Hôtel de Groenendael, a patent of invention for 15 years, for *improvements in the method of applying motive power to engines, applicable to various useful purposes*, Oct. 19, 1840.

R. W. Urling, of St. Josse-ten-noode, rue des Arts, No. 139, a patent of importation for 5 years, for *improvements in pumps, which improvements are applicable to other useful purposes*, Oct. 19, 1840.

William Palmer, of London, represented by Dixon, of Brussels, Hôtel de Groenendael, a patent of invention for 10 years, for *improvements in the manufacture of candles, and an apparatus for concentrating light*, Oct. 22, 1840.

BELGIAN PATENTS TRANSFERRED.

A royal decree of Sept. 23, approves the transfer to J. B. H. Daville Thiry, of Liege, by N. J. Brohée, of Grivegnee, province of Liege, of the following patents; viz.:—

1st, A patent of invention for 10 years, dated Oct. 15, 1836, for *improvements in steam-engines*.

2dly, A patent of invention for 10 years, dated March 20, 1837, for *a process for neutralising the pernicious effects of deleterious gases exhaled from mines*.

3dly, A patent of invention for 10 years, dated July 5, 1837, for *a new kind of steam-boiler*.

By royal decree of Aug. 7, is approved the transfer made to François Devos Poelman, of Ghent, by Joseph Auguste Odeyn, of the patent of invention for 15 years, for *a mechanical method of teaching to write*, granted to him June 10, 1840.

By royal decree of the same date is approved the transfer made to Jean Baptiste Favre, of Paris, by A. A. Bouchet, of the patent of invention for 15 years, for *hydraulic process for the purpose of producing a vacuum, and by the elevation of water a motive power applicable to all machines, by means of compressed steam*, granted to him July 17, 1840.

PATENT LAWS OF BELGIUM.

PATENTS OF INVENTION, IMPORTATION, AND IMPROVEMENT.

Regulation.

"Leopold, King of the Belgians, &c.,

"Considering that some parts of the royal decree of the 26th of March, 1817, relative to the execution of the law of the 25th of January, 1817, concerning patents of invention, have become obsolete, or have undergone, in fact, some modifications owing to changes which have been made in the official departments and to suit general convenience; we have, on the report of our Minister of the Interior, decreed, and decree as follows:—

"Art. 1.—The regulation made by the royal decree of the 26th March, 1817, (Staatsblad, 1817, p. 62) for the execution of the law of the 25th of January, 1817, (*Journal Officiel*, No. 6) relative to the grant of patents of invention, &c., shall be published, altered as below, in the *Bulletin Officiel* of the laws and royal decrees in force in Belgium.

"Art. 2.—Our Ministers of the Interior and of Justice are respectively charged with the execution of the present decree.

"By the King, Leopold.

"Wisbaden, Sept. 25, 1840." "Liedts, "Minister of the Interior."

REGULATION PRESCRIBED BY THE ROYAL DECREE OF THE 26TH OF MARCH, 1817, FOR THE EXECUTION OF THE LAW OF THE 25TH JANUARY, FOR THE GRANTING OF PATENTS OF INVENTION, OF IMPORTATION, AND IMPROVEMENT, REPUBLISHED WITH MODIFICATIONS, ACCORDING TO THE ROYAL DECREE OF THE 25TH SEPTEMBER, 1840.

"Article 1st.—Any one who wishes to obtain a patent of invention, of importation, or of improvement, must send to the registrar of his province a petition to the King, mentioning the general object of his request, his name, designation, and residence, as well as the length of time for which the patent is required, and for which the same invention may have been patented in foreign countries. He must add to it, under seal, an exact and detailed description, signed by himself, of the invention or secret for which the patent is required; accompanied by the necessary plans and designs as required by article 7 of the law of the 25th of J n. 1817.

"Art. 2.—The provincial registrar shall make a declaration (*proces-verbal*) at the back of the packet, giving the date when the petition and its accompaniments were presented; and this declaration shall be signed by him and the petitioner, to whom a duplicate of it shall be delivered.

"Art. 3.—The governor shall afterwards, and at the latest within three days after these forms have been gone through, send to the minister in the department of manufactures all the petitions for patents of invention, improvement, importation, &c.

"Art. 4.—The minister shall present the petitions, with his report, to the King, and when it shall be found that a petition for a patent of invention, &c., is of a nature proper to be granted, he will add to his report the patent for his Majesty's signature.

"Art. 5.—When the King shall think fit not to grant the petition, or to submit it for consideration to the Chamber of Commerce, or to the Royal Academy of Science and Belles Lettres of Brussels, the petitioner shall be informed of that decision.

"Art. 6.—The patent shall contain a description of the invention; it shall mention the rights conferred by it on the patentee, conformably to art. 6 of the law of the 25th of January last, and shall expressly state that the government in granting the patent does not guarantee either the priority or the merit of the invention: and that it reserves the power of annulling the patent for any of the causes indicated in the 8th article of the law. The patent of importation for an invention already patented abroad shall contain, moreover, the express condition that the government does not guarantee the truth of the assertion of the petitioner respecting the duration of the foreign patent. It shall also contain the clause prescribed by the 5th article of the law, that the object or article * patented shall be manufactured in the kingdom.

"Art. 7.—The patentee who wishes to obtain a prolongation for a patent of five or ten years (article 4) must, three months at least before the expiration of the first term, present a petition to that effect to the minister, who will make his report to the King. These prolongations shall be also signed by the King.

"Art. 8.—Every owner of a patent who by new discoveries shall have improved the invention which he has already patented, may obtain a new patent for those improvements, either for the term of his first patent only, or for one of the terms fixed by the 3d article of the law of the 25th January.

"Art. 9.—To obtain this patent, it will be necessary to go through the same forms as for the others. As to the fees to be paid, they shall be regulated in proportion to the length of time for which the right shall be required, and according to the importance of the new improvement.

"Art. 10.—If any one shall introduce an improvement on an invention already patented, he may obtain a patent for the exclusive use of that improvement, without being permitted, under any pretext, to manufacture or cause to be manufactured the primary invention, so long as the patent for it shall continue in force; and the original inventor shall also be prohibited from availing himself of the new improvement. The change of form or proportions, or addition of ornaments of any kind whatever, shall not be considered as an improvement in manufactured articles.

"Art. 11.—Patentees who desire to transfer their rights, either wholly or in part, must procure authority from the King. They must cause the transfer to be registered at the registration office of the province, where a declaration to that effect will be drawn up, according to the form No. 4, which will be afterwards sent to the minister. This declaration will be copied in the register to be hereafter mentioned. Without these forms being complied with the transfer is null and void.

"Art. 12.—Also he or they who by right of succession shall become the owner or owners of a patent, must, before entering into possession of those rights, register their *acquisition* at the registry of the province; where a declaration will be prepared according to the form No. 4, which will be transmitted to the minister, and afterwards copied in the registry book to be hereafter mentioned.

"Art. 13.—At the expiration of patents of invention, or when a patent shall be declared void, in either of these cases, by the 8th article of the law

* The article patented may not be a machine!

of the 25th of January, the minister shall adopt proper measures to make public the discoveries and inventions which have been patented.

"Art. 14.—If at the expiration of a patent, or in consequence of one of the cases provided for by the 8th article, the minister shall not think fit, either from political or commercial reasons, to make the invention public, he shall report the matter to the King, who will decide.

"Art. 15.—The minister shall send the patents of invention, of importation, or improvement, granted and signed by the King, to the governor of the province in which the petitioner is domiciled, mentioning to him the sum to be paid for the patent. The governor shall send the patents to the petitioners when they have paid to the receiver of the province the amount fixed by the tariff.

"Art. 16.—Conformably to article 3 of the law of the 25th January, 1817, the fees to be paid for obtaining patents will be proportioned to the duration of the patent, and to the importance of the invention or improvement. They can in no case be less than 317 frs. 64 c., nor more than 1,587 frs. 30 c. They will be regulated by our minister of the interior. Facilities will be afforded for their payment. Besides, when it shall be proved that the object of the patent is deserving or useful a premium equal to the amount of fees will be granted, without prejudice to greater encouragement, if there be occasion.

"Art. 17.—When a patent is annulled for any of the causes mentioned in the 8th article of the law of the 25th of January, the fees paid for the patent shall be returned, in proportion to the time the patent has yet to run.

"Art. 18.—There shall be kept at the office of the minister of the interior a registry-book, in which the patents delivered shall be inserted, as well as the certificates of grants and the transfer of rights. This registry-book may be examined by those who intend to petition for a patent.

"Art. 19.—There shall be published in the *Official Gazette* the patents delivered, and the names of those who have obtained them."

(Here follow the blank forms, Nos. 1 and 2, of the *procés verbal* or declaration, and of the patent itself.)

The following is the essential part of the former. The rights of patentees under the Belgian law are thus defined:—

"This patent will give to the lawful possessor the right:—

1st. To make and sell exclusively throughout the kingdom, during the time for which the patent is granted, the articles patented: or to allow them to be made and sold by others with his authority.

2d. To prosecute in the courts those who infringe the exclusive right which is granted to him, and to proceed against them for the purpose of obtaining the confiscation, for his own use, of the articles made in contravention of the patent, and not yet sold; and of the price of those articles already sold, as well as to institute an action for damages, if there be occasion.

"The government does not guarantee either the novelty or the merit of the invention, (in patents of importation there will be added, nor the truth of the assertion of the petitioner respecting the existence and duration of the foreign patent), and it will declare the present patent void, and throw it open to the public, for any one of the causes mentioned in the 8th article of the law of the 25th January, 1817.

"The objects patented must be made in the kingdom, and the patentee or his assignees will be liable at the expiration of the time fixed by section E of the 8th article of the law (and sooner if so stipulated in the patent) to produce to the minister of the interior, whenever called upon by him, sufficient proof that the invention patented has been regularly manufactured and offered for sale in such a manner that it may be considered to have been worked advantageously for the country; the government reserving to itself the right to annul the patent if these conditions are not completely fulfilled.

"Finally, the said patent shall be considered as void, if it be proved that its proprietor be not the true inventor of the object patented."

In patents of importation, instead of this last condition there is substituted one which obliges the patentee or his assignees to authorise all the manufacturers of the country, who may require it, to use, on their own account, the invention patented, and to give them all the necessary instructions for so doing, in order that they may manufacture or use it in the same way as himself; for which a fair remuneration (or license dues) is to be paid, to be fixed either by private arrangement between the parties, or, in case of dispute, by arbitration."

These regulations conclude by giving the blank forms (Nos. 3 and 4,) of the certificate for transferring a patent, and the certificate of the acquisition of a patent by succession.

FOREIGN INTELLIGENCE.

FRANCE.

The Academy of Sciences at Paris, which for some time past has not been productive in matters of scientific interest, at its late sittings had brought before it several subjects worth notice. At the sitting on the 26th of October, M. Melloni commenced the reading of a long memoir, containing many facts and experiments, in which he proposes to distinguish the reflected rays of heat from those which are transmitted by radiation, as has been done in regard to the rays of light. When a ray of light falls on a polished surface, it is reflected like a ball falling on a stone, so that if the eye were placed in any other direction than the one in which this reflection is produced, no light would be perceived. When a portion of light is perceived beyond this reflected ray, the surface is not perfectly polished, and a part of the light is radiated, in consequence of the trifling inequalities that it presents. Heat, he affirms, acts in the same manner with respect to the surfaces against which it strikes; that is to say, according to the nature and condition of these surfaces the reflection of the ray of heat may be imperfect; a portion escaping by radiation, as may be ascertained by a correct thermometer placed in the direction of a reflected ray. The immediate object of the numerous and ingenious experiments mentioned in the memoir of M. Melloni, is to distinguish by the most minute investigations rays of reflected from rays of radiated heat, which has been a source of confusion and error to the most learned philosophers in Europe. The memoir was however so long, that after stating the facts at which he had arrived he was obliged to postpone the conclusion, in which the results of his experiments are given, till another meeting.

M. Passot exhibited to the Academy the model of a small pump of his own invention; it is intended to supply steam boilers with cold water. The mechanism of this pump is founded on the principle that a surface unequally heated in different parts receives different pressures from the vapor with which its surface is in contact.

Dr. Kuhn announced that by means of different processes, the first of which is the application of heat, he has succeeded in producing the permanent contraction of a single muscle or of many muscles at once in the limbs and body of a corpse, so as to admit of the greatest facility in studying the manner in which the organs of contraction act on the parts of the skeleton, and even to be able to effect an artificial cure of deformities, which are in the opinion of M. Guerin occasioned by muscular contraction.

BELGIUM.

Belgium in the course of last year has suffered considerably from commercial distress, which still continues to embarrass the discussion on the treaty of the 19th of April. Yet in its foreign connections this crisis has not been attended with the consequences that might be supposed. There has no doubt been a diminution in commercial speculation, but this diminution has not been so great as was apprehended, and besides it was felt as sensibly in the consumption of French merchandise in Belgium, as in the consumption of Belgic merchandise in France, so that if Belgium have sold less, she has at the same time bought less.

During last year the commercial intercourse between the two countries, according to the account of the administration of the French Custom Houses, may be stated as follows:—

General imports from Belgium to France - -	82,868,687f.
Special (consumption of Belgian produce) -	72,215,972f.
General exports from France to Belgium - -	47,029 377f.
Special (French produce) - - - - - - -	39,507,851f.

In 1838 these amounts were respectively 93, 79, 35, and 45 millions. There is then a diminution in general exports of 10 millions, and of 8 millions on general imports. The balance is still more decided with respect to special commerce, since the result of the statement is, that if France in 1839 consumed five millions less of Belgian produce, Belgium in return has consumed five millions and a half less of French produce.

The diminution has been almost equally distributed among the different kinds of merchandise. In 1838 the amount of French consumption of articles manufactured in Belgium was 18 millions, while in 1839 it was only 16 millions; but on the other side the export of articles manufactured in France is reduced from 31 millions and a half to 27 millions. The table of French commerce is also now increased, as may be shown by making a comparison between each kingdom, and by enumerating the principal articles that have been received and sent out of the country.

The number of workmen at present employed at Seraing, the manufactory of the late Mr. Cockerill, is 2,368; of which number nearly 700 are colliers. The collieries and the blast furnaces of "L'Esperance" employ from eleven to twelve thousand workmen; the manufacture of iron at Ougrée 600; and the glass-houses at Val St. Lambert from four to five hundred.

A gratuity of two thousand francs has been awarded by the King to M. Mathieu-Louis Muescler, sub-engineer of the mines at Liege, for the invention of a safety lamp used in those mines. This sum, it is stated, is only given to indemnify M. Muescler for the expenses in perfecting his lamp, the reward for it being deferred until its merits have been further proved by experience.

The Belgian budget for the ensuing year gives the estimate of 29,837,857 francs for the public debt, 960,849 francs for the Marine, 30,525,000 frs. for the War Department, and 11,321,355 francs for the Finance, or a total, with other items, of 105,632,724 francs. This shows a decrease on the expenditure of the present year of 2,265,000 francs. The reason why the saving effected has not been greater is stated to be the extra outlay on railways, fortifications, and the efforts made to extend the foreign commerce of the kingdom by the establishment of Government agents or consuls in various directions.

COPYRIGHTS OF DESIGNS.

(Continued from No. 66.)

NO. OF DESIGN.	DATE OF DEPOSIT.	NAME OF PROPRIETOR.	SUBJECT OF DESIGN.	DURATION OF COPYRIGHT.
	1840			
159	6th Jan.	J. Sugden and Son	Silk Cashmere	1 year.
160	6	Wm. Lund	Letter Weight	3 years.
161 to 169	7	Wm. Evans	Stained Paper	1 „
170	13	Robt. W. Winfield	Letter Weight.	3 „
171	14	James Yates	Fender	3 „
172	14	Henry Brooks	Wafer	1 „
173	15	Carron Company	Fender	3 „
174	15	Ditto	Stove	3 „
175 to 188	16	Wilcoxon and Sons	Stained Paper	1 „
189 to 207	16	Turner and Williams	Stained Paper	1 „
208	22	Thos. and Chas. Hood	Double Valve for Hot-water apparatus	3 „
209 to 224	23	S. F. Scott and Co.	Stained Paper	1 „
225	24	Jno. G. H. Ronketti	Hydrometer Saccharometer	3 „
226	24	Rice Harris	Glasses	1 „
227	27	Wm. B. Maplebeck and Jno. Lowe	Snuffer Tray	3 „
228 to 232	27	Hemmell and Crosby	Stained Paper	1 „
233 to 237	27	Williams, Coopers, Boyle, and Co.	Stained Paper	1 „
238	27	Simon King	Letter Weight	3 „
239	27	Wm. Thorold	Frame work for a Steam-engine	3 „
240 to 241	29	S. F. Scott and Co.	Stained Paper	1 „
242	29	Thos. Nicholson and Henry E. Hoole	Fender	3 „
243	29	Rice Harris	Glasses	1 „
244	29	John Rogers and Sons	Braces	3 „
245	29	Ditto	Belt	3 „
246	3d Feb.	Ditto	Purse	1 „
247	4	Wm. Thornthwaite	Ruler	3 „
248	5	Thos. Staight	Thermometer	3 „
249	5	Rice Harris	Tumbler	1 „
250	11	Henry Tuck	Postage Weight-mark	1 „
251	12	Thos. Edington and Sons	Vase	3 „
252 to 253	13	Christ T. Cooke	Cylinder	3 „
254 to 255	13	Henry N. Turner and Co.	Stained Paper	1 „
256	13	Chas. Griffin	Letter Balance	3 „
257	14	Jas. Dobson and Sons	Carpet Bag	1 „
258	17	Wm. Jas. Curtis	Spiral Spike or Nail	3 „
259	17	Jno. Gold	Drop (Chandelier)	1 „
260	18	Thos. Charles	Desideratum (Coal Cellar Iron Plate)	3 „
261	18	Thos. Lambes and Son	Weighted Ball Valve	3 „
262	18	Henry Knight	Seal Stamp	3 „
263	19	Samuel Downer	Alarum Letter Box	3 „
264 to 265	21	Jno. Gold	Pattern for Glass Articles	1 „
266	27	Henry Longden and Son	Stove	3 „
267	28	Geo. Henry Bursill	Letter Balance	3 „
268	28	Wilcoxon and Sons	Stained Paper	1 „
269	2d March	G. A. and D. Ford	Painted and Japanned Baize	1 „
270	3	Broadhead and Atkin	Tea-pot	3 „
271	3	Wm. Robin	Wooden paving Block	1 „
272	5	Richard Graham	Thrashing-machine Drum	3 „
273 to 274	5	John Ridgway	Jug	1 „
275	5	Summers and Smith	Embossed Paper	1 „
276	6	Thos. Baines	Quilted Stiffener Stock	1 „
277	6	Geo. Henry Bursill	Letter Balance	3 „
278	9	Thos. Hughes	Embossed Cloth	1 „
279	9	John Gold	Glass Dish	1 „
280	12	Jas. Yates	Fender	3 „
281	16	Jno. and Jas. M'Rae	Letter Balance, Thermometer and Hydrometer	3 „
282	23	James Yates	Stove	3 „
283	25	Wm. Potts	Curtain Band	3 „
284	26	Townsend, Parker, and Co.	Stained Paper	1 „
285	27	Jno. and Frederick Weiss	Rotary Fountain	3 „
286	30	Geo. Dacre	Letter Balance	3 „
287	1 April	Christ. T. Cooke	Chimney Top	3 „
288	7	Thos. Boulton, jun.	Peracuter, or Steel for Sharpening Knives	3 „
289 to 290	10	Frederick Harrison	Gambroon	1 „
291	12	Carron Company	Scraper and Pan	3 „
292	12	Coalbrookdale Company	Laundry Stove	3 „
293	13	Jno. Smeeton	Button	3 „
294	15	Wm. Marr	Lock	3 „
295	20	Samuel Ackroyd	Stove	3 „
296	20	Josh. Newcomb and Son	Carpet	1 „
297	22	John Osborne	Box for Delivery of Coals	3 „
298	23	Jacob Brett	Pendulum, or Compensating Quadrants, for Letter Scales and Balance	3 „
299	27	John J. Mechi	Reflector	3 „
300	29	Butcher, Smith and Co.	Carpet	1 „
301 to 302		*Cancelled*		
303	4 May	Jas. Dobson and Sons	Carpet Bag	1 „
304	4	Jas. Woods	Plough-share and Blade	3 „

RAILWAY INTELLIGENCE.
DOMESTIC AND FOREIGN.

Government Superintendence of Railways.—A deputation from a committee formed for the purpose of superintending a petition to Government, praying its protection and interference in the management of railways generally to a much greater extent than is contemplated, waited upon the lord mayor, on Wednesday, with a view to holding a public meeting at the Guildhall. His lordship entirely concurred in the sentiments expressed by the deputation, and kindly offered to afford every assistance in his power; and suggested the propriety of a conference with his successor, who, he felt assured, would aid the cause. A public meeting is shortly to take place at the Guildhall, and no less than 100 gentlemen of the first respectability have enrolled their names as members.—*Globe.*

The *Railway Times*, in noticing the injurious effects of accidents upon railway property, states that the receipts of the London and South-Western (Southampton) Company, for the eight days immediately following the occurrence of the late frightful accident upon that line, were less by £700 (or one-seventh part of the whole amount) than the receipts of the eight days immediately preceding it.

Trespassing on Railways.—A man who had the charge of sheep was fined by the Croydon magistrates on Monday, 40s. and costs, for driving them on the Croydon railway, near Penge-gate. The sheep had been passing in an adjoining field, and the man broke through the fence to get them on the railway, as the nearest way to the gate.

Attempt to extend Railway Works without Act of Parliament.—The directors of the Eastern Counties Railway desire to extend their works at their terminus in Shoreditch, and, in order to do so, have commenced building a thick wall, which would render impassable for carts a street called Goddard's Rents, besides blocking up or obstructing the lights of the existing houses. Not having power in their Acts of Parliament to take or enter upon those premises which are situated on the boundary line of the parishes of Christ Church and Bethnal Green, they sought to effect their object by petitioning the Paving Boards of those parishes to assist them under their local Acts so to do, on the ground that the road sought to be stopped up was useless, or likely to become so. The application was opposed by the inhabitants of Goddard's Rents, many of whom would be seriously inconvenienced by the stopping up of the road; and the Paving Board decided to refuse the application.

The Sunderland and Durham.—The shareholders in this undertaking, and indeed all interested in the welfare of Sunderland, will be gratified to learn that most of the landowners on the line have consented to deduct one-third from their way-leaves, and that the coalowners have agreed to pay an advance of one halfpenny per chaldron per mile on the transit of all coal not intended for the foreign market,—that is, to pay 3½d per chaldron per mile on all coal for the home markets. These important alterations will improve the revenue of the company by several thousands a year, and no doubt very soon raise the shares from their present low quotation. The particulars of the arrangement, (to which, so far as he is concerned, the Bishop of Durham has cordially consented) will of course be laid before the adjourned meeting of the shareholders on Thursday next; but we make this early announcement of the improved aspect of the concern, to put parties on their guard against making "more haste than good speed" in disposing of their shares.—*Tyne Mercury.*

Northern and Eastern.—A further portion of this line was placed under contract on Thursday last, viz., from Broxbourne to Latton Mill, 5½ miles, for about £22,000, which added to £2,500 per mile for the land, and £4,000 for the rails, chairs, and sleepers, will make the total cost of that length about £10,500 per mile, and which will be opened for traffic in April or May next. The remaining portion of the works on this undertaking will be placed under contract in the course of six or eight weeks; they are much the same in character as those above referred to.

Hull and Selby Returns, from Oct. 12th to the 18th, inclusive, for passengers, parcels, and goods:—

Passengers			5,038
Passengers per day			720
Passengers per mile per week			162
Passengers per mile per day			23
Passengers' receipts	£561	1s.	3d.
Goods, parcels, &c., receipts	207	2	7
Total receipts	768	3	10
Receipts per mile per week	24	15	8
Receipts per mile per day	3	10	10

Bristol and Exeter Railway.—A special general meeting of this company was held on Thursday, in Bristol, to determine on the appropriation of the forfeited shares. The resolutions submitted were agreed to, and a spirit of unanimity prevailed. It appears now evident that the shares of the company were bought up by speculators during the railway mania, and this was the cause of the late depreciation in the market; no less than 3,863 shares have now been declared forfeited, after £12 10s., upon an average, had been paid upon them. The number would have been greater had not interest been allowed upon paid-up calls. The forfeited shares are to be distributed among the original shareholders. The lease of this concern with the Great Western Railway Company, with which it was always contemplated it would be materially connected—in fact that one line would feed the other—having been determined upon, the company may henceforth be considered to consist of *bona fide* shareholders instead of mere speculators.—*Bath Journal.*

RAILWAY ACCIDENTS.

Accident to Two Race Horses from Negligence.—On Monday week a horse-box, containing two yearling racers, the property of Lord Westminster, was standing on the line near the Rugby station of the London and Birmingham Railway, when a train which does not stop at that station came up, and ran against the horse-box with great violence. The engine entered completely into the box, and from the force of the shock the contents of the boiler were poured upon the animals, scalding them so severely as to render it necessary to destroy one, and to give little hopes of the other ever being fit for use. It is reported that their owner claims £3,000 for each of them.

Fatal Accident from Carelessness.—A young man, named Wm. Graham, an Irishman, met with a fatal accident at the Bromsgrove station of the Gloucester and Birmingham Railway, on Wednesday week, entirely from his own want of caution. He was waiting at the station the arrival of a train to convey himself and two horses to Cheltenham, when imprudently sauntering on the line, in disregard of the caution against such a practice, he was knocked down by a carriage which was being removed to its proper position against the coming of the train, and the wheels passed over him. On Saturday mortification commenced on the poor fellow's legs, from the effects of which he died on Sunday night.—*Gloucester Journal.*

Recklessness of a Signal Man.—On Wednesday morning, at half-past nine o'clock, an accident of rather a serious nature took place on the Blackwall railway to Charles Holland, who was placed at the Shadwell station, and whose duty it was to attend to the signal in case of danger. Contrary to positive orders he had got some distance eastward of the station-house, and in such a position as to render his situation one of considerable peril. But still such was his recklessness that, though perfectly conscious of his danger, he made no effort to get out of harm's way. The consequence was that the Limehouse carriage, on its upward journey, struck him with considerable force on the chest, and his left leg was lacerated in a very frightful manner by one of the iron steps.

FOREIGN RAILWAYS.

The opening of the inclined planes and of the passage of the great bridge over the Meuse, as well as of the portion of the railroad from the Meuse to Chaufontaine, will take place next July. The Minister of Public Works has expressed a wish that this communication should be established without delay.

RAILROADS IN AMERICA.

By the last annual reports of the Railroad Corporations in Massachusetts, the following appear to be the results of the several railway enterprises in that state:—

Boston and Lowell Railroad.—The total amount of capital paid in by the corporation of this road is 1,650,000dollars. Their expenditures during the last year amounted to 92,151dol. 41c., while their receipts were 241,21dol. 99c. Two dividends, one on a capital of 1,500,000dol., and the other on a capital of 1,650,000dol. The whole cost of the road up to last November has been 1,608,476dol. 21c., leaving a balance of capital unexpended equal to 41,523dol. 79c.

Boston and Portland Railroad.—This corporation have commenced the erection of a bridge of 850 feet in length over Merrimac river, and which is now nearly completed. The capital paid in by stockholders is 278,165dol. 26c., in addition to which the directors have received state scrip to the amount of 150,000dol. Their receipts during the past year have been 69,001dol. 13c., and their expenditures, exclusive of amount for repairs of road, 43,322dol. 67c. The sum expended towards the construction of the bridge is 86,923dol. 13c. One dividend of 2 per cent. was made in April, and another of 4 per cent. in October, making an amount of dividend equal to 18,000dol. The interest paid on state scrip is 5,000dol.

Boston and Providence Railroad.—The expenditures of this corporation, inclusive of sums paid for land and damages, erection of buildings, purchase of a new branch, &c, amount to 194,411dol. 48c. The amount received is 313,907dol. 44c. The amount divided in two dividends of 4 per cent. each is 142,560 dol.

Boston and Worcester Railroad.—For the purpose of meeting the expenditures made for enlarging the general accommodations of this railroad, on account of the important extension of the lines of communication, the stockholders voted to increase the capital stock to 1,800,000dol., by the creation of 1,000 additional shares, all of which have been taken up in part. The present valuation of the road, land, depot, buildings, engines, cars, &c., is at 1,799,255dol. 82c. The amount of income during the present year is 231,807dol. 18c. The expenditure, exclusive of the amount charged for construction, is 126,384dol. 83c. Two dividends, one of 3½, the other of 3 per cent., have been paid, making a sum total of 110,500 dol.

Charlestown Branch Railroad.—The length of this road is 6,900 feet, and it consists of four planes, two level, and two respectively inclined 10·43 feet and 14·11 feet on a mile. The greatest curvature is on a radius of 550 feet. The rails are T pattern, secured to cedar sleepers, resting on a longitudinal sill of pine 4 by 9 inches, which sill is laid on a bed of beach gravel. The total amount of capital paid in by this corporation is 100,200dol. A contract has been made between this company and the Nashua and Lowell Railroad Company for the use of this road. The receipts from assessments have been 50,075dol. The total amount expended is 91,028dol. 33c.

Eastern Railroad.—The passenger trains on this road have been run between Boston and Salem, and the construction of the road, bridges, &c., beyond Salem, is in active continuation. A branch railroad has been constructed and opened to the public from the town of Marblehead to Salem. During the year the number of passengers transported over the whole or part of the road has been

298,813 The income arising from the business of this road, exclusive of the amounts reported last year, has been 125,623dol. 15c. The current expenses, exclusive of the sums reported last year, have been 53,176dol. 17c. From the income of the road there has been paid, interest to the commonwealth on loan 17,416dol. 65c., and dividends among the stockholders, 60,772dol.

Nashua and Lowell.—The whole length of this road is 14½ miles 109 2-10 feet, part of which is in Massachusetts, and part in New Hampshire. The number of planes in Massachusetts is 20, seven of which are level; the number of planes in New Hampshire is nine, of which four are level. The greatest inclination of the planes is 13·70 feet. The radii of the curvatures vary from 900 to 10,000 feet. The total amount of capital stock is 299,000dol., besides 500 shares, or 50,000dol., pledged to the commonwealth. Since the opening of the road the receipts have been 55,053dol. 58c. The expenses during the same period have been 26,395dol. 15c. Two dividends, one of 3 per cent., the other 4 per cent. have been declared, making a sum of 19,475dol.

New Bedford and Taunton Railroad.—The amount received on 2,991 shares is 155,353dol.; and for 50,000dol. scrip, 48,000dol. The expenditure up to the 7th of January, 151,039dol. 42c. The road is expected to be completed and open for use in the course of next summer.

Norwich and Worcester Railroad.—The length of the railroad from Norwich to Worcester is 58·9 miles. The greatest inclination per mile is 20 feet. The rail selected is of the heaviest kind, being 56lb. to the yard. The road passes directly through and near a large number of manufacturing villages, there being, within five miles of the road, 75 cotton and 27 woollen mills, exclusive of Norwich and Worcester. The charge for passengers between Norwich and Worchester is fixed at 2dol., and the charge per ton for merchandise generally, from Norwich to Worcester, is 3dol. 50c., and from Worcester to Norwich is 3dol. The amount of funds from all sources to the 31st of December is 1,360,600dol.; and the expenditure to the same time 1,360,500dol. 27c.

Taunton Branch Railroad.—The total amount of capital paid in is 250,000dol. The expenditure during the year ending November 30, 1839, has been 40,711dol. 78c. The receipts during the same time have been 58,018dol. 78c. Two dividends of 3 per cent. each have been made, amounting to a sum of 15,000dol.

Western Railroad.—The whole of this road eastward of Connecticut was thrown open for the conveyance of passengers on the 1st of October, 1839, and for merchandise on the 23d of the same month. The exact length of the line from the junction with the Boston and Worcester road to the east bank of Connecticut River is 54 miles 184 rods. The cost of this part of the road has been at the rate of about 36,135dol. per mile. Of the 62·6 miles of the road west of Connecticut River, about 50 miles may be ready for the superstructure during the course of the present year.

West Stockbridge Railroad.—The length of this road being only about 2¾ miles in length, a contract was passed between this company and the Hudson and Berkshire Railroad Company to unite the two roads. With these views the last-mentioned company have subscribed a large amount to the stock of the West Stockbridge Railroad, and have executed part of the works on that road, an account of which had not been returned.

PATENT AGENCY FOR IRELAND.

WE beg to recommend our AGENT for IRELAND, Mr. RICHARD TELFORD, 109, STEPHEN'S GREEN, DUBLIN, as the most eligible person whom PATENTEES can employ for the sale of their articles in Ireland. He has a most extensive and respectable connection, and his house is well known as a depôt for patent goods, inventions, &c. We have no doubt of his efficiency to promote the interest of those parties who may favor him with their business.

Mr. TELFORD also undertakes every description of Patent Agency business for Ireland.

TO INVENTORS.

PERSONS WHO WISH TO OBTAIN OR DISPOSE OF PATENTS, *or to bring* NEW INVENTIONS INTO USE, *are requested to apply to the* PATENT OFFICE, BRITISH and FOREIGN, No. 198, STRAND, *opposite St. Clement's Church, where they will meet with great facilities to obtain information and to carry out their views.*

THE GALLERY OF INVENTION,

Attached to the Patent Office, is a spacious Saloon, well lighted, in which Plans and Models are exhibited. It affords an excellent medium for bringing New Inventions into public notice.

TO CORRESPONDENTS.

GRATUITOUS COPIES *of our Journal have been forwarded to a number of Individuals interested in some Patent or Invention, of which notice has been taken in our number of to-day.*

"THE INVENTORS' ADVOCATE" *is published every* SATURDAY MORNING, *at* 7 O'CLOCK; and is regularly issued in MONTHLY PARTS, of which 1 *to* 16 ARE NOW READY.

"THE INVENTORS' ADVOCATE" is also published in Volumes containing the Nos. of every 6 months.

Vol. 1 and 2 handsomely bound are already published.

"A Constant Reader."—*If our Correspondent will call at the* Patent Office, 198, Strand, *he shall receive, gratuitously, the information he requires.*

TO CAPITALISTS, MANUFACTURERS, AND TRADERS.

Among many VALUABLE INVENTIONS *and* PATENTS *registered at the* PATENT OFFICE, BRITISH and FOREIGN, (198, STRAND), *for the investment of capital, Shares are offered for sale in the following Useful Inventions:—*

A Fire Escape of Novel Construction, which may be used as an Observatory.

A Cheap Lamp for burning Tallow and Grease, without overflow or smell.

Patent Screw Jack, for lifting locomotives and other great weights.

An Improved Balance, applicable to small or great weights.

Important Improvement in Wood Paving.

A New and Improved Method of Burning Coke.

New Methods of Purifying and Treating Oils.

Patent Forge Back.

A new Castor for Furniture.

Patent Process for the Manufacture of Soda.

Improved Methods of Building Iron Ships.

A New Method of Tanning.

The Purification of Gas.

THE

INVENTORS' ADVOCATE,

AND

JOURNAL OF INDUSTRY.

SATURDAY, NOVEMBER 7, 1840.

*** *The Office for the publication of* THE INVENTORS' ADVOCATE, *is removed from Tavistock Street, Covent Garden, to the Patent Office, British and Foreign,* 198, *Strand; opposite St. Clement's Church.*

We beg to draw attention to an important decree, regulating the mode of proceeding for obtaining patents in Belgium, recently issued by King Leopold, which appears in another part of our paper. This document, which is of great interest to patentees desirous of securing the exclusive right to their inventions in Belgium, is now published for the first time in England; having been carefully translated and compared with the original decree, expressly for the INVENTORS' ADVOCATE. The publication of such a document, which would otherwise, most probably, never have been seen by English readers, is one of the numerous instances which might be adduced of the advantages to Inventors and Patentees of a journal which attends to and advocates their peculiar interests.

THE COPYRIGHT OF DESIGNS.

We last week commenced the publication of the list of designs registered for copyright from the first entry in August 1839. The list is continued this week, and it is our intention in future to publish the designs as they are registered, in the same manner as patents granted. We before abstained from giving the designs registered, as we attached little importance to the mere list of names with the enumeration of the articles for which copyrights were claimed under the Act; and we conceived that merely to state a copyright had been granted for one or three years for a certain pattern, without being able to give the pattern itself, would convey no information. We find, however, that undue importance is frequently attached to the recent Act, and that parties, unconscious of its peculiar and limited operation, are endeavoring to seek protection for *inventions* under the provisions of an Act which relates merely to *designs*. On looking over the lists we have published, it will be found that nearly one third of the objects registered are the subjects of inventions, and are not merely patterns, to the protection of which alone the Act applies.

The original Act of Parliament for the protection of patterns, which was passed in the 27th year of the reign of George III., limited the monopoly to any new and original pattern on "linens, cottons, calicoes, and muslins;" and the monopoly at first granted only continued for two months. The time was afterwards extended to three months. The justice and propriety of this kind of protection, and its importance, too, as giving a stimulus to manufacturing improvement, was generally recognised; and the same principle being equally applicable to all other patterns, as to those on muslins and calicoes, the provisions of the Act (2 Victoria, c.17,) were made to include designs of all kinds of goods. The principle on which the original legislative protection was founded, remains, however, the same, for though the amended Act extends protection to articles made in metal and wood as well as to those of cotton and paper, it is only the *form*, or the designs, of those articles that are protected.

If a manufacturer brings out a new pattern of a lamp, for instance; that is a proper object for protection by the Act in question. The copyright of that pattern is secured to him by the payment of a comparatively trifling fee. But if there be any peculiarity in the construction of the lamp, independent of its mere form, then it is an *invention*, and can only be protected by patent. The manufacturer may have found the means to supply the wick with

oil without a surrounding and shadow-throwing reservoir. He makes this lamp of a peculiar form, and registers the design, of which he obtains the copyright. He, perhaps, supposes that his claim of copyright extends to the contrivance for supplying the oil as well as to the form of the lamp. But in this he will find himself deceived. Any one may, in such a case, adopt the contrivance, and bring it into immediate competition with the original inventor; provided he only mounts it in a different shape. In the lists we have given will be found several such articles as letter balances, barometers, stoves, barrel organs, pianoforte dampers, telescopes, gun locks, cylinders, smoke consumers, &c., most of which, we may venture to say, found their claim to novelty rather on the peculiar application of the principle on which they act, than on the mere form and pattern in which they are manufactured. In such cases the copyright is utterly valueless, for the registry affords them no protection.

It is of importance to inventors that the extent of protection given by the recent Act for extending the copyright of designs should be accurately known; otherwise they may lose the fruits of their ingenuity and skill in the fallacious expectation that by registering their inventions they have secured an exclusive privilege for three years. It should be borne in mind that the Designs Copyright Act only gives protection to *patterns;* and that when the application of any principle is involved, it is merely throwing money away to register as a design that which is essentially an invention, and can only be secured by patent.

NEW INVENTIONS.

NEW SUN DIAL.

At a recent sitting of the French Academy of Sciences, a report was read of the committee appointed to examine the merits of a sun dial invented by M. de Saulcy for ascertaining the mean time in any latitude.

A sun dial properly set marks the real time at any part of the day; and the mean time is obtained by making allowances for the difference between the real time and the mean time; but in this operation it is necessary to take the equation of time from an astronomical ephemeris, which difference is to be added to or deducted from the real time. It is to save this calculation that M. de Saulcy has invented an apparatus by means of which the dial can be placed every day in such a position as to mark the mean time at any hour, without the aid of the ephemeris, and by merely knowing the day of the year.

If a sun dial be made to turn round its index, the shadow of the sun will indicate the hour sooner or later, according to the motion having taken place eastward or westward. Thus by giving the dial a proper position, the solar shadows will mark the mean time instead of the real time. The meridian of the dial must be inclined every day according to the meridian of the place, either to the right or left, at an angle equal to the equation of time expressed by degrees. On the day when the equation is null, the dial will mark both the real and the mean time, which will take place four times a year.

When the dial is inclined towards the east, for example, it marks the real time at the part situated in the same latitude under a distant meridian at an angle equal to the equation of time. The sun after reaching the meridian of the dial, has still to move for a space equal to the equation of the time, to reach the meridian of the place. It marks thus the real noon of that point, and the mean noon of the place where the dial is placed.

The properties of a dial moving round its index, will be the same when made to turn in the same degree round a line parallel to the index or to the axis of the earth.

The following is a description of M. de Saulcy's sun dial, and of the mode of moving it. He has drawn on a plate of porcelain, about two *décimetres* square (8 or 9 inches), a horizontal sun dial, for the latitude of 45 deg. This dial is attached to an iron rectangular triangle, called *Stellette*, the two sides of which are equal. By this arrangement the hypothenusal line is parallel with the index or gnomon; it is equally parallel with the axis of the earth when the dial is horizontal and properly set. It is round this hypothenuse that the dial is to move, by means of two little pivots fixed to a frame. This frame is like a double desk, being a kind of triangular prism. The large face rests on a horizontal plane, the two others, being equal and opposite to each other, are both inclined 45 deg. to the horizon. It is to the face parallel with the axis of the earth that the two pivots, on which the rectangular triangle turns, are fixed. On the face of the frame parallel to the equator is a toothed wheel, divided into 365 equal parts, for each day of the year. In the centre of this wheel is a circular brass plate, the rays of which vary according to the equation of time. A rod, called *gouvernail*, furnished with a spring which presses against a repeller, the edge of the brass plate, inclines towards the plane of the equator, and gives the angular motion to the triangle which supports the dial, when the toothed wheel is turned by means of a pinion, in order to bring the day of the year under an index properly placed.

The sun dial may be placed on the vertical side of the moveable triangle, and in that case it becomes a vertical sun dial.

When the latitude of the place is more or less than 45 deg., instead of placing the frame on a horizontal plane, it is to be placed on an inclined plane, equal to the difference between 45 deg. and the latitude of the place, so as to have the gnomon always parallel with the axis of the earth. The plane of the dial, which is then neither horizontal nor vertical, will mark the mean time, as if it was placed in 45 deg. of latitude.

This apparatus, made for the northern hemisphere, can be used also in the southern parts of the globe, by placing it in an opposite direction; the morning then becomes evening, and the eccentric curve is to be drawn in the opposite way.

IMPROVED METHOD OF PRINTING CALICOES, PAPER, &c.

During the past week, there has been exhibited in Manchester, a new machine constructed to facilitate the printing of calicoes, *mousselines de laine*, paper hangings, &c., which has caused considerable interest and attention among the trade. The inventor is a Mr. Chassuis, and the patentee, who is introducing it to the public, is Mr. Richard Beard, of London. The first that has been manufactured from the model is by Messrs. Houston, the machine-makers of Manchester. It will be fresh in the recollection of those interested in calico-printing, &c. that some few years ago a new machine designed to carry into effect certain improvements in the printing of calicoes, &c., was invented by Monsieur Perrott, of Rouen, and exhibited at the Exposition in Paris, and subsequently the model was removed to Manchester, from which a number of machines were constructed by the Messrs. Lockett, of that town, and which are now in full work at a print-works near Bury. This machine of Mr. Beard's, it appears, is a decided improvement upon the Perrotive, the latter being only capable of working two or three colors, while the Chassuis of Mr. Beard is capable of working, in handsome patterns, in eight different colors; indeed, it might be so adapted as to print at one time an almost indefinite number. Our Manchester correspondent saw it in full work last week, in the presence of some of the principal practical calico printers, all of whom acknowledged its great utility, both as regarded the economy of its process, and the saving effected in the prices of printing; and no doubt was entertained that it is a machine of the highest importance to the country, calculated to advance the prosperity of the art of printing, and one of the most happy and ingenious inventions with which our industry in mechanical art has been blessed. The eight colors alluded to are worked by means of one copper cylinder and one surface roller—a kind of work which, according to the mode of printing now in use, would have required four or five copper cylinders, and three or four separate blockings by hand. The principle of the invention is simple, works with admirable ease, and (what is most important to the calico printer on the old system) it can, at a comparatively small cost, be adapted to the ordinary machines now in use. It was urged by some of the calico printers who inspected it, that the objections against it were, that the pattern design should be formed for the machine, and that it would be of by far greater utility to the extensive printer whose business was of that nature as to be indifferent to his printing 500 pieces of one pattern. The patentee, however, succeeded in showing that there was not one out of 50 of the present designs that the machine would not print, and that it was equally serviceable to the small printer as the one in a large way.—*Times.* [The specification of Mr. Beard's patent describing the process by which the preceding successful results are obtained, was given in No. 61 of the Inventors' Advocate.]

NEW METAL BUTTON.

A button, to be fixed without sewing, has been contrived by Messrs. Rowley and Smeeton, of Birmingham, which, when put on any garment, cannot be taken off by any ordinary force, or wear. The shank of this button is made hollow, so that it can be readily rivetted, as it were, on to a stud on the other side of the cloth. It has the advantage of being fixed with great rapidity. The inventors say that the usual time required is only two seconds.

IMPROVEMENTS IN GUNNERY.

It is now about eight years since a scientific gentleman who has made many important improvements in fire-arms, tried experiments which convicted him that it was possible to make shells of such a construction that they would explode the moment they came in contact with the object aimed at, whether it was a distance of 50 or 500 yards, or any range within the power of the gun from which the shell might be propelled. This gentleman submitted his views in 1832 to the Board of Ordnance, but as the country was at peace with all the world, and no prospect of any difference with the other great powers, the members of the board did not consider themselves justified in recommending the expense that would be incurred, although it might be but trifling, for the purpose of perfecting the plan submitted to them. Highly to the honor of individual liberality, a gentleman of fortune, to whom the circumstance was mentioned, offered a range of three miles on his grounds, and stated that the invention should be perfected, if it cost £30,000. The inventor accordingly set to work, and succeeded to the utmost extent of his wishes in making a shell which had the desired effect on its striking the object with one of its sides, which it invariably did. The Board of Ordnance have within the last few weeks had several experiments made with this new description of shell, and its effects have exceeded their most sanguine expectations. The only reason for further experiments being necessary, previous to its general introduction as an engine of destruction, for the use of the British army and navy, is a desire on the part of the Board of Ordnance to have the shells of a spherical shape, as that shape would answer the purpose much better, being more familiar to the men employed on large guns. The inventor has acceded to the wishes of the Board, the members of which have given orders for the construction of a new target at the butt in the marshes, sixteen feet larger than the one formerly in use, and of the strongest materials. They have also given orders that some of the most able and experienced gunners

of the Royal Artillery be in readiness to accompany the inventor, and assist in the experiments about to be made in the course of the week, if the weather proves favorable. The experiment will be made from thirty-two-pounder guns, a new battery having been erected, on which six of these pieces have been mounted, as they are most generally used in the British service. The inventor is perfectly satisfied of being able to effect the object desired by the Board of Ordnance, and has no doubt the shells will answer equally well in a spherical form as those already completed. Those only who have seen the effects, and the shattered state of the best and hardest timber on being struck, could believe such damage could be done by such apparently simple means.—*Times.*

ELECTRICAL CLOCK.

A German artist, now in London, is about to take out a patent for the invention of a clock worked by electricity. The machine, which is remarkable chiefly for its extreme simplicity, is composed only of a pendulum, one large wheel, two escapements, and a quadrature. Such are the visible parts. We must suppose, however, that a pinion and a wheel form the communication between this great wheel and the quadrature, though these are not to be seen. The pendulum at each vibration causes one of the escapements to advance the great wheel one tooth, which after this movement has a pause, making the dead second. As there is no metallic moving power to set the machine going, we find, on examining, what keeps up the motion—that the pendulum (which is almost out of proportion with the clock) descends into a case, and there, at each vibration, the ball or body, which is furnished with a conductor, approaches alternately two poles, to which voltaic piles supply their portion of electricity, so that the pendulum, when once put in motion, retains it by means of the electricity alternately drawn from the two poles. There can be no doubt that other interesting results may be obtained by employing the electrical fluid as a motive power, however slight the power which such an agent may seem capable of communicating.—*Morning Post.*

SCIENTIFIC CORRESPONDENCE.

ON THE NEBULOUS THEORY OF THE UNIVERSE.

To the Editor of the "Inventors' Advocate."

Sir,—It has been advocated by several eminent astronomers, that the matter constituting the sun, planets, &c., was originally in a nebulous state, and that similar bodies are now in the process of formation in various parts of infinite space.

What appears to add probability to this hypothesis, is the increase of density in the planets, from Uranus down to the planet Mercury. As it may naturally be inferred, that, as the nebulous matter contracted, its density increased accordingly.

Now, admitting that the density of the nebulous matter surrounding the sun increased during the period in which the planets and satellites were thrown off into their respective orbits, the sun ought by this theory to be more dense than the planets; whereas, the density of the planet Mercury is about *eleven* times greater than that of the sun. A body of so small an attractive power could not by virtue of its attraction have compressed its particles into so dense a body, as it was the lighter parts only of the nebulous mass that were thrown off from the sun's surface to constitute planets; the denser part of the medium having a tendency to approach the centre, the sun must consequently be more dense than the planets.

Now, it is necessary to the establishment of this hypothesis, that the rotation of the nebulous mass should have been continually accelerating; as the *square* of the *periodic times* of the rings of which the planets were composed, must have been proportional to the *cubes* of their *distances* from the centre of the nebulous mass. Consequently, the periodic time of a ring, or planet, revolving at the sun's surface, ought to be completed in two hours 47 minutes 14 seconds; whereas, we know from observation, that the sun revolves once only in about 218 times this period, or in about 25 days 10 hours. The planets must also, agreeably to this hypothesis, have had an acceleration of rotation in the formation of satellites, similar to that of the sun in producing planets; but observations prove beyond dispute, that no *variation* has hitherto been discovered in the planetary periods of rotation. The earth, for instance, presents an object for correct observation, but not the least possible variation has been detected in its rotary motion, it being considered the most uniform motion in nature. Besides, there is too much discordance in the densities of the sun and planets, and in their rotary motions, to be accounted for by this theory; Mercury, Venus, the Earth, and Mars, are of much greater density than the sun; the density of Jupiter and Uranus is nearly equal thereto, while that of Saturn is little more than one-third part of that of the sun, as appears by the following table, containing the orbicular and rotary motions of each planet in *feet*, for one second of time, with the density of each planet, that of the sun being *unity*:—

	ORBICULAR MOTION.	ROTARY MOTION.	DENSITY.
Mercury	158825	597	10 9247
Venus	116188	1519	3·6811
Earth	98816	1523	1·0196
Mars	80054	785	3·4563
Jupiter	43329	40088	0 9406
Saturn	31997	34987	0·3866
Uranus	22562	unknown	0·9502
Sun	.....	6617	1·0000

That, "the fact of the greater tangential motion of the sun plainly shows that it must be *necessarily less dense* than Mercury," appears to me an erroneous conclusion, as the tangential motion of Jupiter is six times, and that of Saturn five times greater than that of the sun; whereas, their densities are nearly equal. Neither is the argument "that the sun is not a planet," at all available in this case, as the planets are to the sun what the satellites are to their primaries, as regards their relative motions.

In respect to the assumption of Mr. Cavalier, viz.—"That, the sun revolving on its axis, disturbs the medium existing throughout the system; throwing as it were this '*ethereal fluid*' over the planets in the line of the direction of its motion, thus striking the spherical surface of the planets tangentially; this would of necessity cause the planets to rotate.* And he supposed that their *rotary* forces were the *primary*, although not the sole causes of their *orbicular* revolutions." (*Inventors' Advocate*, vol. iii., page 141.

Now, according to my ideas of the nebulous theory, the orbicular motion of each planet originated in the rotary motion acquired by the nebulous mass, when in the act of being thrown off from its surface, in the form of rings; that these rings should afterwards be broken up and formed into globular bodies, does not appear altogether feasible. It has been found from observation, that the planet Saturn is not situated in the centre of his rings, which has been recently proved by analysis to be necessary to their stability. Were the rings of Saturn to be broken up, and once to lose their cohesion, they would in all probability lose their equilibrium, and the fragments be scattered over the surface of the planet. As I consider they would have a greater affinity for the planet than they would for each other.

Neither can the rotary motions of the planets be accounted for on the hypothesis of Mr. Cavalier, as the "*ethereal fluid*," in the act of being thrown from the surface of the sun, would decrease in energy proportional to the square of the increase of distance; consequently, the immense velocities of rotation of the planets Jupiter and Saturn cannot be accounted for on this "assumption," as the *largest* planets would by this hypothesis rotate the *slowest*; whereas, the small wheel of a carriage is well known to rotate quicker than a larger one.

Besides, were their orbicular and rotary motions effected by this "*ethereal fluid*," the planets ought to revolve in the plane of the sun's equator, and the poles of the planets ought to be at right angles to the plane of propulsion. How the rotary motions keep the planets from flying off in straight lines, appears to me incomprehensible; as I have always considered it as admitted that a ball shot from a gun, goes the straighter for its having a motion of rotation communicated to it. Were the sun surrounded by a medium, decreasing in density from his surface to the confines of the solar system, the planets circulating in such a medium would acquire a motion of rotation in the same direction as their orbicular motions, from the hemisphere of each planet opposed to the sun having to pass through a denser medium than its opposite hemisphere; but this would not account for the rotation of the planets, as the largest planets would in this case also rotate the slowest, contrary to observation.

In conclusion, I beg to observe, that nebulous matter, so far as we are acquainted with it, is *self-luminous* in a diffused state; it ought evidently to be more so when *condensed*. The sun is *self-luminous*; why, therefore, are the *planets* and *satellites* not so likewise?

I am, Sir,
Yours respectfully,
J. Utting.

Lynn Regis,
Oct. 31, 1840.

* Theory of Mr. Walker.

THE DUCHESS OF KENT AND THE ECLIPSE STEAM-BOATS.

(*To the Editor of the "Inventors' Advocate."*)

Sir,—In reading No. 64, article on "Steam Navigation," I see a comparison between the *Eclipse* and *Duchess of Kent*. I now give you the particulars.

The *Eclipse* draws 5 feet water, is 160 feet long, and 18 feet beam; engine, 100 horse; steeple single wheel, 16 diameter; floats 8-6 long, one foot wide; average diss. 2-3; performs the distance to Margate, 74 miles, in 4½ hours.—30 revolutions.

The *Duchess* draws 6 feet water, is 175 feet long, and 24 beam; engine, (pair of Seaward's patent double slides) 140 horse, beam-engines; wheel 19-6 diameter; float 10 6, and 22 inches wide, 2-6 diss., performs the distance to Ramsgate, 84 miles, in 6½ to 7 hours.—24 revolutions.

The *Eclipse* "flys aft" *when in motion*, and goes *over* the water. The *Duchess* flys by the head 3 or 4 inches, and, consequently, goes *under the water*. Cause of this is, the centre of the wheel in the *Eclipse* is in the centre of the vessel; that of the *Duchess*, from 15 to 20 feet forward of it. As to the tonnage of the *Eclipse*, I should say she is 240 at least, the *Duchess* is 147 exclusive of engine-room, which is about 46 feet long.

I agree in all you have said with regard to *going over the water*, but to do this *economically*, you must have high pressure engines, and to this I see no objection whatever; I do not think *great* speed, say 25 miles per hour, will be attained with low pressure.

Father Thames is the fastest on the river, has two 35 vibrating engines, driving 16 feet wheel, 32 revolutions; but she is built like a wedge, and not in the form I would choose for a boat for *sea purposes*.

I remain your obedient servant,
* * *

Broadstairs, Oct. 29, 1840.

[In our correspondent's description of the comparative working of the *Duchess of Kent* and *Eclipse*, he omits to state that the former starts from London Bridge, whilst the *Eclipse* starts from Blackwall; which would make three-quarters of an hour difference in the passage. The passages he has selected are more favorable for the *Eclipse* than the average. We have made three passages by the *Eclipse*, but she did not on either of those occasions perform the distance from Margate to Blackwall in less

than five hours and a half. We have known the *Duchess of Kent* to perform the distance from London Bridge to Ramsgate in five hours and three-quarters. We believe that, taking the average of passages, the *Eclipse* would be found to gain, as we stated, not more than half an hour on the *Duchess of Kent* between Blackwall and Margate.]

ORIGINAL REPORTS OF SCIENTIFIC MEETINGS.

(Contributed expressly to the Inventors' Advocate.)

MEETINGS OF THE SCIENTIFIC BODIES OF LONDON,—FOR THE WEEK COMMENCING NOVEMBER 9, 1840.

Monday.	Medical Society	8	P.M.
Tuesday.	Meteorological Society	8	P.M.
	Society of Arts (Illustration)	8	P.M.
Wednesday.	Society of Arts	7½	P.M.
Saturday.	Mathematical Society	8	P.M.
	Westminster Medical Society	8	P.M.

LINNÆAN SOCIETY.

Nov. 3. Edward Forster, Esq., F.R.S., V.P., in the Chair.

This being the first meeting of the session, was numerously attended, many of the most distinguished naturalists being present. The secretary announced extensive donations of books, &c., received since the last meeting. Specimens of *Unio mitellinus* and *U. carbonaria*, from Mexico, were presented by M. Henry Galeotti, of Brussels. John Stephens Gough, Esq., and Captain M'Adam were elected fellows. A communication was read on the *Melilotus Rutherica*, or "Bohara Clover." This plant has recently been cultivated in England with great success, and is found most serviceable as fodder for cattle, and for the *fibre* obtained from its stems. It is a biennial plant; its stems rise four feet or more high. It stands the winter and high winds well, and deserves cultivation on account of the beauty of its flowers and herbage, and from the circumstance of its *woody fibre* being in considerable abundance, and readily separated from the vegetable. On the table were specimens of the fibre, and a bundle of stems averaging from 12 to 16 feet high. Three acres had been cultivated by Mr. Loudon.

A paper was then read on some "Non-described Insects from Assam, collected by Mr. Griffiths," by the Rev. F. W. Hope, F.R.S, being a continuation of a former memoir. The paper was chiefly descriptive, embracing some of the most interesting forms of the genus *Leucanus*, surpassing any hitherto noticed in the old or new world. Ten species of this genus were described—the most beautiful and interesting, after Edward Forster, Esq., V.P. (*L. Forsteri*). Several new species of *Lamellicorn* beetles, were also enumerated.

An interesting specimen of the royal chamber (or nest) of the white ants (*Termes bellicosa*), together with the king and queen of the same, were exhibited by Mr. S. Rutherford. The nest was excavated out of hard clay or rock.

On a side table were exhibited specimens of the productions of the Sunflower, from Mr, W. Taylor, including the following articles:—

1. *Hemp.*—Which is obtained from the stems, when bruised and beaten with mallets, after having been steeped in water. The fibre is strong, and has been successfully employed in the manufacture of pack-thread and bags.

2. *Paper.*—After the seed is removed from the head of the plant, there remains a white, shining or silvery fibrous substance, in some quantity, which has been made into paper.

3. *Syrup.*—For medical purposes.

4. *Dye.*—This is procured from the petals, or colored portion of the flower, which is of a bright yellow hue. These petals after being collected and dried on iron plates slowly, when bruised yield a yellow dye, withstanding, to a certain extent, the action of acids and alkalies, and employed for dyeing silks and woollen stuffs, and likewise for coloring tinctures.

5. *Oil-Cake.*—From the seeds (*akenia*) after the oil has been expressed, there remains a cake serviceable for food of bullocks, sheep, &c.

6. *Oil.*—The oil obtained from the seeds by pressure, is serviceable in the manufacture of woollen goods—for lubricating machinery—burning in lamps—for watchmakers, as it does not freeze, and is free from scent. It has been used in the manufacture of soap and bleaching olive oil.

7. *Potass.*—The ashes of the plant have been employed in glass-making.

8. *Gum-Resin.*—This is obtained when the plant is about three quarters grown, and is useful in varnishing carriages, and other processes in the arts.

Green leaves, when dried and bruised into powder, forms good fodder, particularly for milch cows—it may be mixed with chaff or bran.

Mr. Varley attended with his microscopes, and exhibited some new animalcules, the *screw-animalcule*, obtained from salt-water ditches at Southampton and Tilbury Fort. They were intermixed with other genera, especially *Bacillaria* and *Oscillatoria*, the siliceous cases of the former forming *Tripoli* or polishing stone. Some interesting multilocular specimens of microscopic shell (*Foraminifera*), from gravel stones (flint), and from dirt obtained from the interior of mussels, were likewise beautifully shown by Mr. Cornelius Varley.

ENTOMOLOGICAL SOCIETY.

Nov. 2. John Walton, Esq., V.P., in the Chair.

A letter was read for Mr. Griffiths, of Affgahnistan, East Indies, volunteering his services for promoting entomology, in acknowledgement for the honor the society conferred on him by electing him a corresponding member.

Mr. Westwood read a paper "On the Development of the body in the *Myriapoda*," (Centipedes), in which he is inclined to support the idea, that, in this order, the instances of supposed reproduction of limbs are merely the effects of retarded development, and not as Mr. Newport believes of reproduction. He alluded to an apparently new genus of *Myriapoda*, which he intends describing on a future occasion.

A communication was read from Mr. Hope, on a "New mode of Entrapping Wasps," with a model of a trap, which he had found very efficacious. It consists of two square garden fan-lights placed one on the top of the other, the bottom one perforated by a tube at the top; at the bottom of the under one, fruit or flesh to attract the wasps is placed, the insects, on rising into the upper chamber, are there entrapped.

Mr. Abel Inkpen has recommended the same plan for entrapping not only "insect enemies, but insect friends."

The secretary read remarks on the specimens of *Staphylinidæ*, described by Linnæus, most of which are preserved in the collection of the Linnæan Society.

The Rev. F. W. Hope exhibited portraits of the Swedish naturalists (entomologists) Thunberg and Gyllenhal, the latter of whom is recently dead—he was a major in the Swedish army, and one of the most acute entomologists of modern times. A portait of Mr. Hope was suspended in the meeting room.

SOCIETY OF ARTS.

Nov. 4. Hughes Hughes, Esq., V.P., in the Chair.

This being the first meeting of the session, but little scientific business was transacted. The secretary announced the various presents that had been received during the vacation. The minutes of the last meeting were read and confirmed—in which, among other interesting details, it stated that a letter of thanks had been received from Lord Palmerston, for the report made by the society on Brazilian tea; the letter was accompanied with printed reports.

The following gentlemen were elected members:—Rear Admiral Sykes and Henry Fedwich, Esq.

A list of communications respecting new inventions, &c., was read by the secretary, as having been received—the titles were read seriatim, and referred to their respective committees to report upon. A letter of thanks from the Committee of the Hon. East India Company, addressed to Mr. Arthur Aikin (late secretary), was read, being an acknowledgment for his valuable services in classifying and arranging the immense collection of East Indian woods, brought into this country by Dr. Wallach, some years ago. The collection was divided into two sets, one presented to the Society of Arts, and the other kept by the East India Company.

A letter was also read from Mr. Woodthorpe, the city clerk, inquiring whether the society had under consideration any models of fire-escapes, as the Committee of City Police were desirous of inspecting them, and having the opinion of the society on the subject.

A discussion ensued on a proposition being made to the society by 20 members, respecting the change of evening for the illustrations. According to the present arrangement the society holds its ordinary meeting every Wednesday evening during the session, and the illustrations are held the *second Tuesday* in the month—it is now proposed to alter the nights of illustration to one of the ordinary meeting nights, which proposition was referred to a general meeting.

The following Illustrations will be given at the Society's House in the course of the ensuing session, and will begin at eight o'clock in the evening precisely:—

Nov. 10. On Bronzes. By J. De Ville, Esq.
Dec. 8. On the Crania of different Nations. By J. De Ville, Esq.
1841. Jan. On Vegetable Fibre, its Structure and Uses. By A. Aikin, Esq.
Feb. On Vegetable Fibre, its Structure and Uses. By A. Aikin, Esq.
March. On the Mechanical Processes of Sculpture. By C. H. Smith, Esq.
April. On the Phenomena attending the Deposition of the Nutritious Particles in Organized Beings in general. By M. Truman, M.D.
May. On the American Patent Process of the Daguerreotype, and its Application to the taking of Portraits from Life, with the recent improvements. By J. F. Goddard, Esq.
June. On the Construction of the Polariscope, and its application to useful purposes. By E. M. Clarke, Esq.

The dates of the illustrations to be given in the months of January, February, March, April, May, and June, 1841, will be shortly announced.

The committee to whom the details of the management have been entrusted, request that such members as are disposed to contribute either information or the loan of specimens illustrative of the above subjects, will notify the same to the secretary at their earliest convenience, in order that the society may, in the most advantageous manner, avail itself of their liberality.

It is proposed, likewise, to exhibit, on the evenings of the illustrations, characteristic specimens of natural substances, especially of those that form the raw materials of the arts and manufactures of the country; likewise tools, instruments, and models of machinery, samples of new and beautiful fabrics, and fine works of art. The loan of such or other objects of interest will be particularly acceptable, and it is requested that they may be sent in the day before the meeting, that they may be properly arranged.

HORTICULTURAL SOCIETY.

Nov. 3. Dr. Henderson, V.P., in the Chair.

The specimens exhibited at this meeting were principally of fruits; including 40 varieties of apples from Mr. Kenny; five varieties of pears from Mr. Wilson, gardener to the Duke of Norfolk.

A new variety of Esperione grapes, cultivated at the gardens of the society, and grown in the open air, together with 16 varieties of pears, and eight of the newest varieties of apples, were shown as cultivated at Chiswick.

Among the flowers were four new *Orchideæ* from Guatemala, from Mr. Dean, and the *Salvia regla* from Mexico (a new variety), from the gardens of the society. Mrs. Lawrence obtained the silver knightian medal, for specimens of *Calanthe densiflora* and *Cattleya labiata*, and Mr. Dean for specimens of *Odontoglossum-grande*. The secretary announced the donation of the last part of the "Flora Græca," published by the trustees of the late Dr. Sibthorp; at the completion of which a chair of rural economy and agriculture was to be made in the University of Oxford—and which chair has just been filled by Dr. Daubeny, the Professor of Chemistry and Botany at the University of Oxford.

The extract from the metcorological register, kept at the gardcos of the society at Chiswick, from 20th October to 3d November, gave barometer, highest, Oct. 24—30.124 inches; lowest Oct. 28—29.114 iuches. Thermometer, highest, Oct. 31—57 deg. Fahr.; lowest, Oct. 28—28 deg. Fahr. Quantity of rain, 1.42 inches.

ON LONG AND SHORT STROKE STEAM ENGINES.

By John Seaward, C. E.

(*From the Civil Engineer.*)

A popular notion has for a considerable time past prevailed, that a long stroke engine is much superior to a short stroke engine; and it will consequently be found that the practice of most, if not all engineers, is greatly regulated by this idea. On very careful consideration, however, it does not appear that this alleged superiority can be satisfactorily proved. That a long stroke engine, under certain circumstances, may be much more advantageously employed than a short one, is undoubtedly true, but considering the steam-engine *per se*, that is, without reference to adventitious or extraneous circumstances, it would be difficult to show that the former has any advantage whatever over the latter.

For let a careful comparison be made of a long stroke engine with a short stroke engine; let there be two beam engines of thirty horses power each, both equally well made, but the one having a stroke of eight feet, while the stroke of the other is only four feet, the cylinder of the latter being double the area of that of the former; it being understood that both engines shall make the *same* number of revolutions per minute; the steam passages and valves to be of the same area and capacity; and the two engines in all other respects to be well proportioned, and made without any limitation as to space or weight.

Now as regards the mere mechanical effect of the moving power (*i.e.* of the steam) it is perfectly clear that it must be precisely the same in both engines, because the same volume of steam must produce the same mechanical effect whether it is let into a long narrow cylinder or into a short wide one; therefore, if there be found any difference in the efficient duty or economical working of these two engines, that difference must arise from circumstances quite unconnected with the mechanical effect of the steam power.

The only circumstances which really can make any essential difference in the efficient duty or economical working of these two engines are these:—First, the greater or smaller quantity of friction in the various parts of the machines. Second, the greater or lesser radiation of heat from the cylinders and passages. Third, the greater or smaller loss of steam by the clearance of the piston at the top and bottom of the cylinder. Fourth, the *inertia* and the impulse of the parts of the machine in motion on the surrounding air.

First, then, of the *friction*. It will be found in the working of a well-made engine of the proportions of the short stroke engine under comparison, that more than four-fifths of the whole friction are due to the packings of the piston and air-pump bucket, and of the piston-rod and bucket-rod,* and less than one-fifth to the main gudgeons, the end gudgeons, the crank pin, and other moving joints about the engine. But the friction of the piston packing will vary as the circumference of the piston, multiplied into the distance which the piston travels. Now, in the long stroke engine the piston, supposing it to be 30 inches diameter, will move eight feet, and the friction of the packing be therefore as 24, while in the short stroke engine the piston will be about 42·4 inches diameter, will move only four feet, while the friction of the packing will be only as 17. In the same way it can be shown that the friction caused by the packing of the air-pump bucket, of the piston-rod, and of the bucket-rod, is also respectively in the ratio of 24 to 17, in the two engines. With respect again to the friction due to the main and end gudgeons, &c., it is clear that it will be less in the long stroke engine, because in the latter engine the force acting upon these parts will be one-half what it is in the short stroke engine. Assuming therefore 100 to be the whole quantity of friction in an ordinary engine, then 80 of these parts in the short stroke engine will be due to the piston, air pump, bucket, &c.; while in the long stroke engines the friction of these parts will be as 113, that is $=\frac{24}{17} \times 80$, but the friction on the main and end gudgeons in the former engines will be as 20, and in the latter only 10, making the total friction in the short stroke engine 100, and in the long stroke engine 123, or one-fourth more.

Second.—The *radiation of heat* will be in proportion to the extent of surface, but the surface of the long stroke cylinder is much greater than that of the short cylinder, whence it follows that the loss by radiation in the former must be greater than in the latter.

Third.—The *clearance of the piston* at the top and bottom of the cylinder, which will evidently be greater in the short stroke engine than in the long stroke engine. Because the area of piston in the former is double that of the latter, some persons would be disposed to say, that the loss by clearance in the former must be double what it is in the latter; but this is not quite certain, for it is not required to give so much clearance in a 4 feet stroke cylinder as it would be advisable to give in an 8 stroke cylinder, the reason of which is obviously that the spring and elasticity of the parts in the long stroke engine, must be much greater than in the short stroke engine, and that they must therefore require more clearance. However, it is probable there would be more loss in the latter engine than in the former.

The loss of steam by filling the passages and nozzles, as also by the radiation of heat from those parts, must evidently be the same in both engines.

Fourth.—*The inertia and impulse of the moving parts on the surrounding air.* The loss in a steam-engine occasioned by these two causes may not be very considerable; indeed as regards what is called the *inertia* of matter in the moving parts, it is doubtful whether any such source of loss really exists; however if it does exist, it is clear that the amount of loss must vary in proportion to the *momenta* of those parts of the machine which are in motion, but as the *momenta* must be as the mass of matter in motion multiplied by the velocity, and as these are evidently much greater in the long stroke than in the short stroke engines, (because the parts in the former, are, if any thing, of greater weight than in the latter, and also move at a double velocity,) it follows that whatever loss may arise from the *inertia*, must be much greater (double?) in the long stroke engine than in the short stroke engine. With regard to the loss occasioned by the impulse of the moving parts on the air, it must be admitted that in very slow motions it cannot be very important; nevertheless with as material increase of velocity this source of loss becomes serious; it varies as the extent of surface of the moving parts multiplied into the *square* of the velocity. It is tolerably manifest however that the surface of the moving parts in the long stroke engine, will be, if any thing greater than in the short stroke engine, and that the velocity of the former will be twice that of the latter; therefore the loss by impulse on the air in the long stroke engine must be four times that in the short stroke engine.

Beside the foregoing causes, it is doubtful whether there are any others that can produce any material difference in the efficient duty or economical working of a steam engine; at least none that can in any way influence the question now under consideration. In estimating, therefore, the advantages of the short and long stroke engines, we have in favor of the former a diminution of loss occasioned by friction, by radiation, by *inertia*, and by impulse on the air; while on the other hand, we have in favor of the long stroke engines a diminution of loss in the clearance of the piston at the top and bottom of the cylinder. It may be difficult to strike an exact balance between these several sources of loss; but there can be no doubt that in a steam-engine the loss by friction is much greater than the loss by all the other causes beforementioned put together; and it is past dispute that the balance of loss as regards these causes, is decidedly against the long stroke engine. (The advantages offered by the short stroke engine as regards diminution of space and weight, although of vast importance, are not here adverted to, because they form no part of the immediate inquiry).

It may be objected that to select an engine with an 8 feet stroke and a cylinder of only 2½ feet diameter for comparison, is not a fair proceeding, beause an engine of such proportions is unusual; and it may he also asked whether, if the principle is further extended by making the stroke only 2 feet, and again doubling the area of the piston, the advantage would still be in favor of the short stroke engine?

To this it may be answered that although an engine of 8 feet stroke and 2½ feet diameter of cylinder may be unusual in this country, it is not so in America; in that part of the world, many engines are employed of very nearly the above proportions, for purposes of steam navigation; and in which engines it is not unusual for the piston to travel at the rate of 300 or 400 feet per minute. Again, as regards the carrying out of the principle by still further reducing the length of stroke, say to two feet, and increasing the diameter of cylinder proportionately, say to 5 feet, there is no douht whatever that such an engine would have precisely the same mechanical effect as either of the other two; but the balance of advantages would be against an engine of such proportions; because it would be verging to an extreme on one side as much as the 8 feet stroke engine may be thought extreme on the other side. It may, however, be safely affirmed that the principle applies most powerfully to the case where the diameter of cylinder is the same as the length of stroke; because in that case the proportions are most favorable for the diminution of friction and of radiation, and offer the minimum of disadvantages under the several heads of loss above enumerated.

As it is manifest, therefore, that in all particulars which more immediately affect the beneficial employment or working of a steam-engine, the long stroke has no manifest superiority over the short stroke, it may appear strange that so decided a preference should have hitherto been given to the former by the generality of engineers. Perhaps this is chiefly to be attributed to the circumstance of the long stroke offering on most occasions greater convenience than a short stroke. Much may be due also to fashion. The earliest applicatiou of steam power was for the purpose of pumping water in the course of mining operations, and in this sort of work a good long stroke was found to be attended with considerable convenience and advantage. In blast-engines, and many other of the earlier applications of steam power, the same result was manifest; the earlier habits and ideas of engineers were therefore naturally associated with long stroke engines. Moreover, the earlier manufacturers of steam-engines had

* The friction of the slide is not included, as that will obviously be the same in both engines.

neither good machinery nor good workmen; they could neither depend upon the correctness of their proportions, nor upon the exactness of the workmanship; besides, timber and other inefficient materials were formerly employed to a considerable extent in the construction of engines; from all which causes imperfections and irregularities were numerous in the earlier engines, and they were consequently very inefficient. As all these sources of imperfection and inefficiency operated much more extensively against short stroke engines than against long, it is no wonder that the latter soon obtained a preference, and that the prejudice should still continue to exist, notwithstanding the same causes are no longer in operation. At the present day, with our good materials and workmanship, exact proportions and adjustments, a short stroke engine will be found to work as accurately and as perfectly as a long stroke engine.

SCIENTIFIC MEMORANDA, AND NOTES ON ART.

Respiration.—In ordinary respiration, 16 or 17 cubic inches of atmospheric air pass into the lungs 20 times in a minute, or a cubic foot every 5¼ minutes; 274 cubic feet in 24 hours, or a cube of 6½ feet each way. At each expiration, 1.375 of the oxygen is converted into carbonic acid gas; in 63 minutes a cubic foot, and nearly 23 feet in 24 hours. The loss of the air in bulk by respiration is but 0.12 per minute, or only the tenth of a foot in 24 hours. The nitrogen inspired and expired is exactly equal. If then the relative specific heat, or atomic motion of oxygen and carbonic acid, as the mean of Crawford and Dalton, be taken as 3.65 to 1, and the absolute heat of a cubic foot of oxygen as 876 deg., the difference between inspired oxygen and expired carbonic acid is 688 deg. for every foot in 63 minutes, 0.53 deg. by respiration, or 688 deg. X 23 = 15,824 deg. X 87.6 deg. or 15,911.6 deg. in all, for heat and strength in ordinary respiration per day.

The Oak.—Dr. Greville has presented to the Botanical Society of Edinburgh a series of specimens of *Quercus Robur*, exhibiting an extraordinary range of form. From the singular variation exhibited by these specimens, in the fhape and texture of the leaves, and in the length of the sootstalks, Dr. Greville is of opinion that there is but one species of oak indigenous to Britain.—*An. Nat. Hist.*

Cambrian Iron Works.—We understand that this company have blown in one of the furnaces on their works at Llwyn. The blast was put on the No. 4 furnace on Monday se'night, and the first cast was tapped in about twenty-four hours after. The iron was of excellent quality, and the "sow and her pigs" weighed nearly six tons.—*Mining Journal.*

Mineral Wealth of Northumberland.—From examinations which have been made, there is no doubt that a rich bed of ironstone exists in the neighborhood of Elsdon. Considering the rich mines of iron that are already in course of being worked by the Hareshaw Iron Company and the Reedsdale Iron Company, it is probably not too much to anticipate that Northumberland will become one of the richest iron districts in the kingdom.—*Mining Journal.*

A monument, in honor of the great astronomer Copernicus, is about to be erected in his native place, Thorn, in Germany. A similar memento is going to be placed in the town of Annecy, Savoy, in memory of the celebrated chemist Berthollet, who was born there.

A steam fire-engine has been invented at New York, by Captain Erichsen. It weighs only 2¼ tons, and will throw 3,000 pounds of water per minute to a height of 105 feet, through a nozzle of 1½ inch diameter.

Survey of the Northern Counties of England.—The secretary of the Manchester Geological Society has received a communication from the Lords of the Treasury, announcing their intention to conduct the survey of the six northern counties of England on an enlarged scale of six inches to the mile, instead of two inches, the size adopted for the other counties, and that they are to commence with Lancashire forthwith. This is a matter of very great importance to the landed interest, as well as the proprietors of mines, coal mines, and quarries, and hence to the community at large in this thickly-peopled district. For this important improvement in the survey, we are indebted to the exertions of the Geological Society of Manchester, with whom the idea originated. They memorialised the Treasury, and influenced other scientific societies to follow their example, and thus paved the way to this important result.—*Manchester Chronicle.*

Discovery in Electricity.—A curious, and probably a most important discovery in this branch of natural philosophy, was made about a fortnight ago in a boiler attached to a hauling engine, at Seghill, on the Cramblington Railway, near Newcastle. The engineman, on attempting to lay hold of the lever of the safety valve, received what he describes as a severe blow, which nearly caused him to fall; he, a second time, attempted it, and received a similar blow. This having been made known, an examination of the boiler followed, and it was found that the steam which was escaping from a "*blower*" near to the safety valve was highly charged with electricity. Our informant states that on himself placing one hand in the steam, sparks upwards of half an inch in length were emitted from the other, and this whilst he stood upon the masonry which was surrounding the boiler: so that had he been upon a glass stool the effects would have been much greater. We are glad to hear that this discovery is being followed up by experiments on other boilers. When the discovery was made, it was considered by many to be owing to the quality of the water used, which was pumped from the coal mine; subsequently, however, on trying the steam from a locomotive engine on the Newcastle and North Shields Railway, a great quantity of electricity was obtained, and the water used in this case was from the River Tyne. The subject is highly interesting, and we hope that the discovery may lead to useful results; the explosion of boilers has hitherto baffled research, and it is not improbable that electricity is intimately connected with it.—*Durham Advertiser.* [The fact that electricity is excited by the conversion of water into steam, has been long known; but the novelty in this case is, that it should be given out in such a condensed form as to produce an electrical shock.]

New and Important Surgical Operation.—On Thursday last the subcutaneous section of the muscles of the back, for the cure of lateral curvature of the spine, was, for the first time in this country, performed by Dr. Hunter, Professor of Anatomy, Andersonian University, Glasgow, in the presence of a number of the *élite* of the medical profession. The operation consists in cutting across the muscles of the back that produce the curvature, and although it has the appearance, at first sight, of being a formidable operation, yet it is so cunningly and simply performed under the skin, that the patient, although in this instance a delicate young lady, complained of no pain, lost not more than three drops of blood, and was only thirty seconds under the hands of the operator.—*Glasgow Paper.*

Nitrate of Soda as Manure.—The following is the result of an experiment of nitrate of soda on wheat, at Newton Hall, Northumberland:—In the spring of this year one acre of wheat was set out from a field which had been equally worked and manured prior to sowing. The acre was as equal in quality as the field from which it was selected would admit of. One half of it was treated with four stones of nitrate of soda in April, and the following is the comparative produce of each half acre:—With nitrate, 18 bushels, weighing 76 stones, with 142 stones of straw: without nitrate, 15 bushels, weighing 64 stones 11lb., and 117 stones of straw: difference in favor of the nitrate, 3 bushels 11 stones 3lb. of corn, and 25 stones of straw. There is no discernible difference in the samples from each half acre, but it will be seen by the above that the produce of the nitrated half acre does not weigh as much per boll as the other.—*Newcastle Journal.*

VARIETIES.

Fresh-water Fish of Guiana.—There exists in the river Rupununi, a fresh-water fish called the Arapaima, or Pirarucu (a specimen of which in a dried state, stuffed, may be seen in the British Museum, in the fish-room,) which attains occasionally a length of 12 feet, and weighs upwards of three hundred pounds. It is used fresh and salted, and affords the means of subsistence to a large number of inhabitants on the river Negro and the Amazon.—*Schomburgh on the Productions of British Guiana*, 1840.

To join Sheets of Paper.—To prevent the puckering caused by paste or glue, substitute a thick solution of caoutchouc, which being applied to the edges of the paper, is allowed a little time to dry and get sticky before the sheets are joined together.—*Mechanics' Mag.*

Gold and Silver Coin.—Gold is considered the standard metal; and there is no alteration, either in weight or fineness, from former coinages; the sovereign, or 20s-piece, being 20·21 parts of the weight and value of a guinea, and the other pieces in the same proportion. Thus 934½ sovereigns weigh exactly 20 *lbs.* troy. Also the real weight of the sovereign is, five *dwts.* 3,274 *grs.*, and that of the half-sovereign, two *dwts.* 13.637 *grs.* The silver coins are also of the old standard fineness, of 11 *oz.* 2 *dwts.* of pure silver to 18 *dwts.* of alloy; but 1 *lb.* troy of this standard is now coined into 66s. instead of 62s. as was formerly the case. So that of this coinage:—

	DWTS.	GRS.
One shilling weighs - - - - -	3	15 3-11
The sixpence ,, - - - - -	1	19 7-11
The fourpence ,, - - - - - -	1	5 1-11
The crown ,, - - - - -	18	4 4-11
The half-crown ,, - - - - - -	9	2 2-11

It appears that the value of 1 *lb.* of silver is 66s or. £3 6s; and of an *oz.* of gold, is 46 2s 40 sovereigns, or £46 14s 6d. Standard gold is 14 times that of the silver, and 7-44ths more.—*Gregory's Ephemeris*, 1839.

An explosion of fire damp took place in one of the Dundyvan coal-pits on the morning of Saturday last, by which two of the workers were killed, and three others very severely injured. William Donachie, and Brown, a boy, are the names of the deceased. The others injured are Solomon Gabney, Christopher Laird, and a brother of the boy Brown. The former of the three has had his leg amputated, and all of them remain in a very dangerous state. The accident occurred in consequence of Gabney going with his common lamp into a part of the pit where the foul air had been confined from the previous day.—*Glasgow Chronicle.*

Churchyards of the Metropolis.—CLEMENT'S LANE.—This is a narrow thoroughfare on the eastern side of Clare market; it extends from Clare-market to the Strand, and is surrounded by places from which are continually given off emanations from animal putrescence. The back windows of the houses on the east side of the lane look into a burying ground called the "Green Ground," in Portugal-street; on the west side the windows (if open) permit the odor of another burying-place, a private one called Enon Chapel, to perflate the houses; at the bottom, the south end, of this lane, is another burying-place, belonging to the Alms-houses (this place is, I believe, filled with dead; many of the coffins being near the surface); within a few feet of the S tand, and in the centre of the Strand, are the burying ground and vaults of St. Clement Danes, in addition to which there are several slaughter-houses in the immediate neighborhood: so that in a distance of about 200 yards, in a direct line, there are four burying-grounds; and the living here breathe on all sides an atmosphere impregnated with the odor of the dead. The inhabitants of this narrow thoroughfare are very unhealthy; nearly every room in every house is occupied by a separate family. Typhus fever in its aggravated form has attacked by far the majority of the residents, and death has made among them most destructive ravages.—*Gatherings from Grave-yards of London, by G. A. Walker, Surgeon.*

ADVERTISEMENTS.

MECHANICS of SCIENTIFIC INGENUITY, who wish to show the process of their works to the PUBLIC, are invited to make early application at the POLYTECHNIC INSTITUTION, for the remaining positions appropriated for that purpose. WORKING MODELS and other INVENTIONS, which may tend to demonstrate PRACTICAL and EXPERIMENTAL SCIENCE; also first-class WORKS OF ART, are now received, and will be brought before the PUBLIC at the RE-OPENING of the INSTITUTION, on the 30th inst., without expense to the DEPOSITORS, whose names will be placed on the FREE LIST.

309, Regent Street, R. I. LONGBOTTOM,
Nov. 7, 1840. Secretary.

N.B.—Mr. Maugham lectures to a Chemical Class, and conducts Analyses and Assays in the LABORATORY.

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ACTS OF PARLIAMENT.

PATTERNS,—
27 Geo. III., c. 38 2 Victoria, c. 13; 2 Victoria, c. 17. (The last relates to patterns and *models*.)

PATENTS FOR INVENTIONS,—
2 and 3 Victoria, c. 67.

SCULPTURES,—
38 Geo. III., c. 71.

ENGRAVINGS,—
7 Geo. III., c. 38; 17 Geo. III., c. 57.

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8 Anne, c. 19; 12 Geo. II. (Booksellers' Act), c. 36; 15 Geo. III. (Universities' Act), c. 53; 54 Geo. III. (General Copyright), c. 156.

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Mining Journal Office, 37, New Broad-street,
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THE

INVENTORS' ADVOCATE,

AND JOURNAL OF INDUSTRY;

A WEEKLY BRITISH AND FOREIGN MISCELLANY OF

SCIENCE, INVENTIONS, MANUFACTURES, & ARTS.

No. 68.] SATURDAY, NOVEMBER 14, 1840. [PRICE FIVEPENCE STAMPED. CIRCULATING FREE BY POST.

RESISTANCE OF THE AIR TO MOTION ON RAILWAYS.

It is stated on authority, founded, too, on experiments, that the resistance of the air to the motion of railway carriages increases so rapidly, and to such an amount, with greatly increased velocity, that it is inexpedient, if not practically impossible, to attain a greater speed than thirty or thirty-five miles an hour. Not many years ago it was as confidently asserted, that it would be impossible for any person to be moved through the air with greater velocity than thirty miles an hour, because such a speed would obstruct respiration. Experience has exploded the latter notion: the former one maintains its ground; though it is questionable whether it rests on a better foundation than the positive assertion of the same authority, that it would be impossible to establish a communication by steam-boats between England and North America. Varying circumstances may render a higher rate of speed attainable with advantage on some railways than on others; but we propose to show, by a comparison of facts, that the proposed limitation of the speed of locomotion, has been made without due consideration; that there exists means of diminishing the resistance; and that when the difference of time is taken into account, the saving in friction and of continued resistance will counterbalance the additional hindrance to motion from the air.

There are few questions less determined than the ratio of the resistance of fluids to bodies moving through them. The amount of resistance not only varies with the density of the fluid and the rapidity of the motion, but it alters, also, in a different ratio, according to the extent of the moving surfaces, and their shapes. It is generally assumed, that the resistance of fluids is as the square of the velocity of the moving body, but this rule is liable to many exceptions. For instance, the resistance is not in proportion to the extent of surface, but increases considerably faster. It has been found, by experiment, that surfaces of the same shape having the proportion to one another in size of 9, 16, 36, and 81, and moving with the same velocity, meet with resistance from the air in the proportions of 9, 17½, 42¼, and 104¾. Again: a flat surface moving directly through the air meets with much more obstruction than the same resisting surface if in a globular form. That is to say; if a globe were divided into two, the resistance it would meet with in moving through the air would be much greater if the area of its great circle were exposed to the action of the air, than if its spherical part were presented to it. Were the globe hollow, the difference would be still further increased. The frequent experience which every one must have had when holding an umbrella on a windy day, is sufficient to prove the great difference in the action of the wind on convex and concave surfaces. In considering the resistance of the air to motion on railways at different velocities we shall, however, in the first place, assume that the surfaces are the same, and of the same shape.

It has been experimentally ascertained that a flat body moving with a velocity of twenty miles an hour meets with a resistance from the air of 2 lbs. on every square foot of surface. If the velocity is doubled the resistance is quadrupled. At a velocity of 30 miles an hour the resistance from the air is about four pounds and a half on each square foot; at 40 miles it is eight pounds; at 50 miles, about 12 pounds; and at 60 miles an hour, 17 pounds. Taking the surface of a railway engine and carriage exposed to the direct action of the air in front at 30 square feet, the total resistance from the air at a velocity of 20 miles an hour, would be 60 lbs; at a velocity of 30 miles it would be 135 lbs.; at forty miles, 240 lbs.; and at sixty miles, it would be 510 lbs. This difference appears to tell strongly, at first view, against the rapid motion; but we must take into consideration the respective times during which these resistances would operate. On a journey of 120 miles, the slowest engine would encounter the resistance of 60 lbs. for six hours; the engine that moved with the speed of forty miles an hour would have to contend against a resistance of 240 lbs. for three hours; and the fastest engine would have a resistance of 510 lbs. to its motion for two hours. If we multiply the resistance by the time of its action we shall have the respective numbers of 360, 720, and 1020. The difference, therefore, in the total amount of resistance from the air between the 20 mile an hour speed and the 60, is not quite three to one.

In the preceding calculations we have not taken into account the action of the wind, but have merely estimated the amount of resistance when the train is propelled at great velocities through a tranquil atmosphere. The effect of the wind, however, constitutes, in practice, a material consideration. It will be found that in whatever direction the wind blows, its effect will be to diminish the proportional resistance between the higher and lower velocities. Suppose, for instance, that a wind moving at the rate of 20 miles an hour were blowing in the opposite direction to the motion of the train. The effect of such a wind on the engine moving at the same rate would be to increase the resistance of the air to the same degree as if the carriages were propelled through a motionless atmosphere at the rate of 40 miles an hour. The amount of such resistance we have stated to be about 8 lbs. to the square foot. The total resistance on a surface of 30 square feet would then be 240 lbs.; which number multiplied by six, the hours required to complete the journey of 120 miles, would be 1440. The resistance to the train propelled at the rate of 60 miles an hour would increase by the same wind from 17 lbs. the square foot to about 30 lbs. The total resistance would be 900 lbs.; which multiplied by two, for the time during which this resistance would have to be encountered, gives 1800. The difference between the smaller and the greater velocity would, in such a case, be not more than in the proportion of 14 to 18; instead of one to three. When the wind blows transversely, the difference would be still farther diminished, for the resistance would be increased to the same extent in both cases; whilst the slowly moving train would have to contend against it three times as long.

It has been stated by Dr. Lardner, as one of the results of his experiments to determine the resistance of air to the motion of railway carriages, that the form of the engines or carriages makes no difference in the amount of resistance; and that the distance between each carriage does not materially alter the result. From this statement we are induced to doubt the correctness of his experiments, as well as the conclusions he draws from them. It is a well-established fact, that the forms of bodies moving through a resisting medium, is a very important consideration. The difference in the resistance to a sphere moving through water, and to the base of a cylinder of the same diameter, has been determined to be double; and every-day experience proves that the impulse of the wind varies

materially according to the form of the surface on which it strikes. Why locomotive engines and railway carriages should be exempted from the general law, has not been explained; and we suspect that the retardation of motion which Dr. Lardner ascribes to the resistance of the air must have depended on other causes.

We entertain no doubt that if the speed of a railway train be so great as to occasion a sensible resistance from the air, the extent of that resistance may be greatly modified by the form of the engine and carriages which are opposed to its action. To what extent the resistances we have indicated may be diminished by the shape of the surface that meets the air, can only be determined by experiment; but every diminution of resistance by this means will be in favor of the higher velocities.

It appears from this consideration of the subject, that the increased resistance of the air by increasing the velocity does not present any real impediment to a much greater speed on railways than has hitherto been practically attained. There are other advantages from the proportionate diminution of friction at high velocities which much more than compensate for the increased resistance of the air; but this part of the subject we must leave for another occasion.

THE VENTILATION OF MINES.

The Academy of Brussels last year proposed a prize for a paper on the following question:—To examine and discuss the means of preventing explosions in coal-pits. On the proposition of M. Nothomb, then Minister of Public Works, the King, by a decree of the 22d June, 1839, added a sum of two thousand francs to the prize founded by the Academy. When the papers were delivered, a committee of the members, consisting of Messrs. Cauchy, d'Omalius, Dumont, and Hemptienne, were appointed to examine them. There were fourteen memoirs entered for the prize. None of the memoirs were considered worthy of the prize; but the committee selected five which they thought possessed merit, and to the writers of which they proposed that rewards should be given. These memoirs have lately been published among the transactions of the Academy. The following notice of them is translated from *L'Emancipation*. The subject is an important one, and we wish that the accounts given of the memoirs were more descriptive and less vague; but it may serve to show the points to which attention was directed, and to develop some suggestions that appear to be new, and capable of being worked out to advantage.

It is in our opinion to M. Boisse that we are especially indebted for having thoroughly investigated the difficult subject of the ventilation of mines. We know that the passages of mines are generally very narrow. It is through these narrow passages that a current of pure air must be circulated, sufficient to dissipate the foul air which escapes from the fissures of the mine. The volume of air required to go through these passages every minute it is very easy to ascertain; but to introduce into the subterranean passages of these mines the volume of air that is wanted, requires very powerful mechanical or chemical agents. It will be understood that the velocity with which the current of air traverses these passages must be regulated by the quantity of pure air admitted. It is ascertained that, according to the usual dimensions of the passages of mines, the velocity of a current of air ought to be nearly two metres and a half in a second. But an unforeseen and insurmountable obstacle prevents the possibility of this velocity being obtained. So powerful a current of air would cause the flames in the safety lamps to flare up higher than the covering of metallic gauze intended to confine them. Thus, in the present state of our mines, ventilation will always be encountered with difficulty, owing to its interfering with plans of security of another kind. This is the best proof we can give of the necessity of some alteration in the present system.

M. Boisse has great confidence in fires, as a means of ventilation; but he justly remarks that these fires are, after explosions, very difficult to re-light. He suggests the plan that every workman should propose to the administration such means of security as he thinks likely to succeed; the ratification of this plan by government would induce an obligation to effect it, and the inspection of the engineers would secure its being put in practice. This plan, which protects the general interest with respect to all the acts in which public security is involved, will doubtless be ultimately adopted.

M. Gonot has only considered a part of the question submitted to him by the Academy. He confined himself to the question of ventilation. He, among many other interesting matters which he discusses, assigns the cause why so much greater a quantity of foul air escapes when the barometer falls, owing to the variation of heat of the ventilating furnace. He discusses very completely the plans proposed for a good ventilation of mines; but we are sorry that M. Gonot, as he himself states at the conclusion of his memoir, has not had time "to demonstrate how his system of ventilation can be applied without difficulty in all cases which are met with in the working of coal mines." On this subject he only offers a few very general remarks; yet this notwithstanding was the question which he intended most particularly to consider. We must say however, that this memoir is of a very superior order, and that it is calculated to diffuse many excellent ideas on the manner of ventilating mines.

M. Bischof, professor of chemistry and chronology at the university of Bonn, is the author of the third memoir. He has, as he himself informs us, been long engaged in the composition of this production; yet he says, notwithstanding, that he does not consider it sufficiently mature to be submitted to competent judges. In fact the greater part of this singular memoir is occupied in stating the progress of the science, without contributing to its advancement; yet we must acknowledge that it is a very considerable and remarkable work. The author is the only competitor who has produced chemical analyses of coal gas. We are also indebted to him for very curious comparative trials of a great variety of safety lamps on different principles.

The fifth memoir—we shall return immediately to the fourth—is from M. Motte, a mechanical engineer at Marchiennes-au-pont. This memoir contains but single theory, but it has at least the novelty of containing a new idea.

The author proposes to apply the Archimedes screw to the ventilation of coal mines. This proposition is new, and deserves to be submitted to the test of experiment. The economy of the moving power, that a first calculation supposes, would be very considerable. Thus, this apparatus, already so useful in its application to the purposes of draining marshes and canals, would, if his calculation be correct, at last render a most signal service to miners. Let us congratulate the author on so fortunate an invention, one which promises to be equally fortunate in its application.

We must now make a few remarks of a critical nature on the work of M. T. Lèmielle of Namur. We will frankly state that this memoir in our opinion is not quite suited to the collection of transactions published by the Academy. In the first place the historical part is treated in a very concise manner. The author gives the following description of the kinds of furnaces now employed in the ventilation of mines. "In this plan the fire is drawn back considerably out of its usual course, the air cannot reach the furnace without encountering certain impediments, besides it is suspended some fathoms under ground, surmounted by a chimney; but should a tempest or a storm arise, a powerful wind forces its entrance into the workings, entirely changing the course of the air, and the workmen are exposed to imminent danger. The same effect is produced upon domestic fires; the wind rushes down our chimneys, and drives into our rooms large puffs of flame and smoke: the security of these furnaces is then only contingent. They ought, therefore, to be entirely prohibited, as well as the use of uncovered lamps, in the mines."

M. Cauchy has taken the trouble to refute before the Academy the opinion of the author, that bad air can be made to ascend by the shaft; but he at the same time expressed a wish that the lamp proposed by the writer of the memoir might be submitted to experiment.

We can but agree in this wish, already in a great measure accomplished by the exertions of a special commission assembled at Liege.

M. T. Lèmielle appeared to have great confidence in the solidity of the lamp, of which he has unfortunately only given us an unintelligible description. He says in one place, "it is composed of copper soldered in copper, in such a manner that the soldered parts are more solid than the others."

With respect to this plan of ventilation, he does not himself appear to consider it perfect, for he gives us the following account of the result of its application. "The workmen might receive a violent blow by the detonation, and be thrown to the ground by the violence of the wind, but never lose their lives, by asphyxia, in hundreds, which happens in the former method of ventilation, and is the cause of certain death."

PATENTS.—BRITISH AND FOREIGN.

ENGLISH EXPIRED PATENTS.

EDWARD THOMASON, of Birmingham, goldsmith and silversmith, *improvements in the construction of medals, tokens, and coins*, Nov. 9.

SPECIFICATIONS OF ENGLISH PATENTS

ENTERED AT THE ENROLLMENT OFFICE.

(*Continued from page* 291.)

WILLIAM PEIRCE, of James-place, Hoxton, ironmonger, *improvements in the construction of locks and keys*, Nov. 2.—Claim first.—Mode of constructing detecting locks.

A sliding bolt is arranged inside these locks, so that one end of it may be acted on by all, or any of the tumblers; the other end of the bolt is jointed to one end of a small lever, which works on an axis; just under the key-hole is a tubular piece containing a dart, and a compressed spiral spring; in the under side of the dart is a notch, into which the free end of the lever takes, and keeps the dart concealed; if the lock is attempted by a false key, and any one of the tumblers raised above its proper height, the raised tumbler will lift the sliding bolt, and that, acting on the lever, sets free the dart, which will then spring out and wound the hand that turned the key.

Claim second.—Mode of applying spring stops to keys.

A metal stop is fitted so as to work freely inside the pipe of the key, and is affixed to one end of a spiral spring of a proper size; the other end of a spring is fixed in the pipe at the end nearest the bow, by this means no dirt can enter the pipe of the key.

FRANK HILLS, of Deptford, manufacturing chemist, *certain improvements in the construction of steam boilers and engines, and of locomotive carriages*, Nov. 5.—Claim first.—Employment of a series of vertical tubes partly filled with water, and having small pipes passing down their centres, forming passages for smoke or heated air.

It is preferable to have these tubes of copper, and of about eight inches diameter; their ends are closed

by having discs of metal brazed inside each end; these discs are perforated with holes to admit pipes of about half an inch diameter. These pipes are made to pass through the vertical tubes, which are ranged in any convenient form, and partly filled with water by means of short pipes with union joints, and appropriate cocks communicating with a water main near the bottom of the tubes. There s a similar arrangement of short pipes and cocks communicating with a steam main near the top of the tubes, so that there is a constant water and steam communication, whilst the smoke and heated air passes off through the small pipes in the centre of the tubes. When using this apparatus, it is better to obtain the heat by consuming gas, naphtha, oil, turpentine, &c., instead of coals.

Claim second.—Employment of a series of vertical tubes which are closed and unconnected at the top, and open at the bottom end, which communicates with a chamber or series of chambers partly filled with water, and which tubes have small pipes passing up their centres, for the purpose of conveying the steam to the boiler with which they are connected.

This part of these improvements is almost described in the claim; the heat is obtained by consuming coals supplied by a hopper, which has a closed lid and sliding bottom, by which means the fire is supplied with fuel. The back and sides of the fire-place are constructed of ranges of pipes containing water.

Claim third.—Use of flat chambers connected by means of pipes, filled with water, the upper portion of such chambers forming steam chambers.

These flat chambers are placed vertically, and are each formed of two plates of metal; the outer ones being dished or turned over at their edges, so as to form a proper space for the water. They are fastened together, one by means of screws, the other by means of rivets at their flanges, which are made for that purpose. They are supported by means of bolts of the same length as the width of the boiler, and placed in rows at about four inches apart. These chambers are connected by means of pipes, one end of which is screwed into the back plate of the front chamber, and the other end is brazed into the front plate of the back chamber, and in such a manner that the front chamber is sufficiently elevated to allow the steam to rise without any water being forced upwards. These chambers and pipes are only partly filled with water, thereby leaving a space at the upper part which serves as a steam chamber.

Claim fourth.—Employment of wooden felloes to wheels used for locomotive and other carriages, which felloes are enclosed between two vertical wrought-iron rings to which the spokes of the wheel are welded.

These felloes are composed of segments, and are sufficiently wide to stand out about an inch from the side of the wheel; it is preferable to place them in such a manner that the grain radiates from the centre of the wheel.

Claim fifth.—Employment of hollow arms, which are open at the ends on which the wheels revolve, and through which opening the driving shaft passes.

These arms are formed by two bars of iron being fastened together at their ends and bent in the middle, so as to form an opening of sufficient width for the cranks of the main axle to revolve, the ends of which pass through and work in openings made in the fastened ends of the bars, the outside of which form axles for the locomotive wheels.

Claim sixth.—Employment of collars or enlarged pieces running in bearings which have a groove, and are connected with the brass containing oil, in order that a regular supply may be afforded to the working parts requiring the same.

The remaining part of these improvements relates to steam-engines, and applies exclusively to those known as Hero's engines.

Claim seventh.—Method of filling up the space between the arms of the engine.

Claim eighth.—Method of reversing the motion of the engine by employing two sets of arms, with other apparatus hereafter described.

Claim ninth.—Mode of inserting a wooden block or other slow conductor of heat between the tube which communicates the motion and the driving shaft.

Four pipes are each bent near one end to nearly right angles; they are then fixed in a short tube at right angles with each other, and with the bent ends of each pair turning in opposite directions; the intervening space is filled up with wood, or plates of metal, so that the whole forms a wheel, with the ends of the bent parts projecting from its periphery. Inside the tube in which the arms are fixed is a rod which commands valves at the end of the pipes in such a manner that on its being drawn outward the steam is allowed to enter one pair of the arms; which, being in a line, and with their ends pointing in the same direction, are made to revolve, and on the rod being pressed inwards, the action is changed by shutting off the steam from these arms and admitting it into others, which then revolve in a reverse direction to the former; the resistance of the atmospheric air being considerably lessened by the space between the arms being filled. On one end of the short tube is a flange by which with the arms it is connected to the main shaft, which has also a flange for that purpose. Previous to being fixed together, a block of wood or other slow conductor of heat is inserted, to prevent the main shaft becoming too hot by the working of the engine.

Claim tenth.—Mode of imparting motion to an engine shaft by means of an arm or crank being fixed on the middle of such shaft, and driven by one of two connecting rods alternately, which are both driven by the piston rod, and guided by radius rods.

Two connecting rods have each one end jointed to the outer end of the piston rod. On the other ends of each connecting rod is formed a fork of steel; an arm or crank is fitted on the middle of the shaft, its end fitting the interior of the forks, into one of which suppose it to have taken. On motion being given to the piston rod, the arm will pass the line of centre, rising and turning outwards, until it has described a semicircle, when the other forked rod comes into operation, drawing it downwards and inwards until it has finished the revolution, which is again repeated; the forked connecting rods being guided in their action by radius rods, working also on the main shaft.

THOMAS WALKER, of Gabashields, Selkirk, mechanic, *improvements in apparatus applicable to feeding machinery employed in carding, scribbling, or teazing fibrous materials*, Nov. 7.—Claim first.—Mode of feeding machinery employed in carding, scribbling, or teazing fibrous materials, by causing the products of one machine to be continuously conducted to another.

Claim second.—Mode of taking off the products doffed off such machinery, in a direction transversely to the machine.

Claim third.—Means of applying sliver to a carder or other machine, and of regulating the distance to be traversed by the carriage.

The wool being previously weighed, *i. e.* a certain quantity for a given length of cloth, it is spread on a scribbling feeding board, and passes through, and is taken off a doffer by a comb, when it falls on an endless cloth; this cloth conveys it to a tube, by which, with drawing rollers, it is converted into sliver; this sliver is conveyed off through conducting rollers, to a position opposite to the centre of the carder, whence it passes through a feeding tube, having a regular alternate motion, to between drawing rollers, and from thence to the ordinary feeders; so that by a careful adjustment of the parts, the ingress and egress of the sliver is continually going on in an equal and uniform manner; in the event of the wool or fibrous material being short, it would be better to pass the sliver through an additional drawing roller, the machinery being constructed in such a manner that the same may be easily added if necessary. A simple arrangement of gauge-screws pass through the side of the machine, and are adjusted by nuts. These screws together with a spiral spring acting on a catch lever and studs in a sliding bar, change the action of the rachet wheels attached to the carriage, reversing its motion and regulating the distance it shall traverse.

HENRY HOLLAND, of Darvin-street, Birmingham, *improvements in the manufacture of umbrellas and parasols*, Nov. 7.—These improvements relate to the ribs, stretchers, and bits of umbrellas and parasols.

Claim first.—Mode of manufacturing the ribs and stretchers of steel or other metal tubes, as hereafter described.

Claim second.—Mode of constructing and fixing the bits to the ribs and stretchers.

Sheet steel is converted into tubing in the usual manner, and tempered, the joint not being soldered or brazed; the tubing is then cut into proper lengths for ribs and stretchers; at the top end of the ribs, a small indent is cut, and a similar one is made in that part where bits for holding the stretchers are fixed; the ends of the stretcher lengths are filled and made solid, by inserting a piece of metal; the parts called bits are simply pieces of metal, embracing the rib, and projecting in front sufficiently for the stretchers to be rivetted thereto. They slide freely on the rib to their proper place, when by a sharp blow, a bur is formed inside, which takes into the indent made in the rib for that purpose: the top tips are fixed in the same manner; the bottom tips are first fixed with glue, and then a hole is drilled through the tip and rib, for the purpose of holding the cover, which also secures the tip.

BERNARD AUBE, of Coleman-street Buildings, *improvements in the preparation of wool, for the manufacture of woollen and other stuffs*, Nov. 7.—Claim first.—Mode of preparing wool by the use of oleic acid.

Claim second.—Mode of preparing wool by the use of oleic acid, submitted to an alkaline solution.

The inventor observes that by using oil in the preparation of wool, much expense is incurred, which may be avoided by substituting oleic acid, that being much cheaper, and will answer the purpose as well, and may be used in the same manner and without any extra trouble. The quantity to be regulated by the workman. This forms one part of these improvements. The next is by extracting the oleic acid in such a manner as to convert it into a saponaceous product, to be used in the manufacture of cloth, which is effected in the following manner. Soda of half the weight of the oleic acid known to be used, is dissolved in a quantity of water of twice the weight of the wool prepared; after the oleic acid has been extracted from the wool by means of this alkaline solution it will be found converted into a saponaceous product, and found particularly useful for fulling cloths.

HENRY MONTAGUE GROVER, of Boveney, Buckingham, *an improved method of retarding and stopping railway trains*, Nov. 7.—Claim first.—The application of electro or other magnetism, for the purpose of retarding or stopping railway trains.

A magnet, of the ordinary horse-shoe form, is let into a block of wood, and fixed by sustaining rods in such a position that its ends are a short distance from the face of the tire of one of the wheels. A galvanic battery is placed on the bed or platform of the carriage, and a connection of the magnet and the face of the tire of the wheel formed when necessary, by means of connecting wires, which will cause the wheel to be retarded or stopped. These magnets may be applied to any number of wheels in this manner, or through one magnet to a lever, and by cranks or other apparatus, indirectly to the wheels.

ENTERED AT THE ROLLS CHAPEL OFFICE.

(*Continued from page* 276.)

THOMAS GADD MATTHEWS, of Bristol, merchant, *certain improvements in apparatus for sawing, rasping, or dividing wood, or tanners' bark*, Nov. 5.—These improvements consist in certain arrangements of circular saws, by means of which the wood or bark is reduced to a finely-divided state, in a more eco-

nomical and expeditious way than has been effected heretofore. The peculisr feature of the improvement is the combining and attaching a number of circular saws upon a rotary spindle in such a manner thst they are nearly contiguous to each other, so that if any piece of wood be brought under their operation, it will be finely divided without leaving any veneer. The circnlar saws are mounted on their spindle at an oblique angle thereto, the spindle is mounted in adjustable bearings, the saws are screwed up between two cheeks, by means of bolts and nuts, and as they become worn away the bearings that carry the shaft on which they revolve must be brought more forwsrd, which is effected by adjusting screws. The log is brought under the operation of the saws by means of gearing, arranged in such a manner that the gravity of the log assists the operation, by causing it to slide or move down an inclined trough, as its lower end becomes sawn or rasped away by the action of the saws; the upper end of the log is kept steady by means of pins or spikes attached to the end of a sliding rack, to one end of which is fixed a counterweight, by means of a cord or chain, which passes over a pulley, and the object of which is, to assist in raising the rack, when a fresh log is to be placed in the trough; fast and loose pulleys are mounted on the driving shaft, to which motion is communicated by any prime mover.

The claim is, for the application of rotary circular saws to the rasping or reducing to powder of wood or tanners' bark, for the use of tanners or dyers, in whatever manner the said saws may be applied.

WILLIAM NEWTON, of Chancery-lane, Middlesex, *an improved apparatus or process for producing sculptured forms, figures, and devices, in marble and other hard substances*, (being a communication from a foreigner residing abroad), Oct. 22.—These improvements consist, first, in the construction of a mould, die, or matrice, of metal or other hard substance, in which the counterform of the figure or device intended to be sculptured has been made, and its application to the stone or marble intended to be cut.—Secondly, in the means by which the sculpturing is effected; viz., by the repetition of slight but rapid blows of the mould, or die, struck against the face of the stone, by which the surface becomes abraded, and particles are gradually broken off, leaving the stone ultimately in a form, or figure, corresponding to the mould or die which has been working upon it.

Claim.—Application of a mould or striking die, which being by any arrangement made to strike a rapid succession of light blows on the substance to be sculptured, shall abrade or wear away the superfluous parts of the surface of the material under operation, and produce a form, or figure, corresponding with the mould or die.

The mould must be mounted in any convenient mechanical apparatus capable of holding, raising, and depressing it, that it may strike very light but rapid blows on the face of the block to be sculptured, which must be supported upon firm stationary bearings; the mould or die is securely attached to a lever, which is a strong frame of iron, mounted on pivots, which are made adjustable, in order to regulate the height of the frame, from the block of marble or stone; to the outer end of the lever a staple also adjustable by a screw and nut is fixed, to which is attached a cord, also connected to a series of cranks and rods, which are mounted in a horse-shaped frame; a crank in the lower end of this series is acted upon by stops, notches, or teeth, in the periphery of a tappet or rachet wheel, which is acted on by a pulley being made to revolve on its axis driven by a band from any first mover; so that on a rotary motion of the tappet wheel, its teeth will act against the arm of the lower crank, and produce a slight reciprocating motion in the series of cranks and rods, which will be communicated through the cord to the lever which holds the mould, thereby causing a rapid succession of slight blows to bear upon the surface of the block, and in a short time to abrade all those parts of the stone against which the mould or die strikes. The process will be facilitated by the introduction of sand, emery, or diamond dust, with water, at an early stage of the work, and may be introduced by a simple inclined plane, or in any convenient manner; towards the end of the process a finer powder should be used, and the work will leave the mould in a highly-finished state. This invention applies to busts, statues, and groups of figures, even the most complicated and extensive, and finishes them with the greatest delicacy, only it is necessary to employ several small moulds instead of one, and it will act equally well on crumbling stone, that would not bear the chisel, as upon a solid mass.

The inventor claims no particular arrangement of apparatus for causing the mould to strike the face of the block, although he considers that above described suitable and appropriate for the purpose.

GEORGE MACKAY, of Mark-lane, ship-broker, *certain improvements in rotary engines*, (being a communication from a foreigner, residing abroad), Nov. 5.—These improvements consist in a certain arrangement of parts, whereby much compactness of form is obtained, and economy secured, and also such an application of the elastic force of the steam employed as to ensure the greatest efficacy of action; and is applicable in all cases where a motive power is required, but is especially suited in all circumstances where a saving of space is an object; the supply of steam to the engine is regulated by a cock in an ordinary steam pipe; this cock is acted upon by a rod working between guides in a slot in a bar, which is jointed to one end of a lever, and has its reverse end acted on by a spring which regulates its action on a valve; this spring acts on an axle, on which a racket wheel is mounted so as to enable it freely to yield to the impulse of the bar; the rachet wheel is furnished with a pall in the usual manner to prevent its turning back; a steam reservoir is provided in the form of a quadrant, and answers the purpose of the ordinary cylinder; it is placed over a wheel which has projections on its periphery; these projections are successively admitted by the action of the steam into the reservoir; the wheel has a shaft properly mounted and turning on plummer blocks, which are fixed on the frame-work of the engine; a valve is formed for keeping in the steam until the projection, or stud, which is being propelled forward by its elastic force, passes the mouth of the eduction passage; this valve is acted on by a spring, the moment it has allowed the projecting stud to pass by it out of the reservoir. The action of the parts is as follows:—On the steam being admitted to the reservoir, its elastic force is exerted between the valve, and the projection, or stud; the former, being unable to move, acts as an abutment for the steam, while the latter is being driven forward by its pressure, and fitting exactly the space between the outer rim of the wheel and the internal periphery of the reservoir, it receives on its surface the full force of the steam until it reaches the mouth of the eduction passage, when, after allowing the steam to escape, it passes off through the valve, just previous to which time another projection has entered the quadrant through the valve, to be acted on in a similar way. The valve acts in the following manner:—the inclined plane of the advancing projection coming in contact with it forces it up, which causes the lever to be in nearly a horizontal position, carrying with it the bar; this acting on the rod shuts the cock as soon as the valve begins to open; the whole remains in this state until the studs have passed from under the valve, and entered the steam reservoir, when the spring causes it to fly back against the periphery of the wheel, which motion also opens the cock, and admits a fresh supply of steam.

The claim is for a combination of parts so arranged as to produce the effects above stated.

ERROR.—*In Mr. Wilkins's specification, in our last number—the words "wall-lamp," used in the second claim, should be* "table-lamp."

NOTICE.

In accordance with the determination expressed in our 26th Number, of giving one month's clear notice to Inventors, before publishing their specifications, we hereby inform the following Patentees, that their specifications will be published in the "INVENTORS' ADVOCATE" of Dec. 26. Each party will receive, in addition, a *private* communication to the same effect.

Richard Prosser, of Birmingham, and John Jsmes Rippon, of Wells-street, Middlesex, due Dec. 17.

Richard Prosser, of Birmingham, due Dec. 17.

Thomas De la Rue, of Bunhill-row, manufacturer, due Dec. 20.

FOREIGN PATENTS.—FRANCE.

SECOND QUARTER OF 1839.

(*Continued from p.* 293.)

No. 43. Etard, J. C., 10 years, for *a packing-case*, (2d addition,) April 25, 1839.

44. Fabre d'Olivet, J. A. D., 10 years, for *a new system of paving*, April 25, 1839.

45. Irroy, S., 5 years, for *new nails made by machinery from heated iron*, April 25, 1839.

46. Lhuinte, E. A., 10 years, for *springs applicable to furniture generally, and for elastic mattrasses without frames*, April 25, 1839.

47. Mirial, S., 10 years, for *an improved mode of combing, applicable to the refuse of silk*, April 25, 1839.

48. Prevost, C. D., 5 years, for *knitting machinery*, (2d addition,) April 25, 1839.

49. Richaud, J. B., 15 years, for *a new process of making bread, and a machine for the same*, April 25, 1839.

50. Ricord, A., a second addition to patent for 15 years, dated Oct. 23, 1838, for *an axle-tree with guard-wheels*, April 25, 1839.

51. Royer-Truchelet, and Valson, C., 15 years, for *a sawing machine with circular saws*, April 25, 1839.

52. Weber, J., 5 years, for *a mill for grinding colors*, (2d addition,) April 25, 1839.

53. Cail, J., 5 years, for *a joint for steam-boiler and other pipes*, April 29, 1839.

54. Cambray, A. B., 5 years, for *an apparatus composed of a straw-cutting machine, a grinding-mill, and a root-cutting machine, worked by one motive power*, (2d addition,) April 29, 1839.

55. Champavère, F., 15 years, for *a rotary steam engine*, April 29, 1839.

56. Crespy, P. B., 5 years, for *an anti-ophthalmic remedy*, April 29, 1839.

57. Edwards, J. E., represented by Salomo Hermz, 5 years, for *brushes, brooms, and pencils*, April 29, 1839.

58. Evrard Latron, L. P. M., 5 years, for *protractor measures of length*, April 29, 1839.

59. Faullain de Bauville, F. E., 10 years, for *an eccentric umbrella walking-stick*, April 29, 1839.

60. Feuillatre, E. J., 10 years, for *an hydraulic bidet*, April 29, 1839.

61. Godin, N. P., 5 years, for *billiard cushions*, April 29, 1839.

62. Grimoux, J. F., 5 years, for *surgical instruments*, April 29, 1839.

63. Guenon de la Chanterie, J. B. L., 5 years, for *an inodorous water-closet*, April 29, 1839.

64. Milleret, J. F., 5 years, for *a balsamic lotion for the teeth*, April 29, 1839.

65. Mitifiot, F., addition to patent for 5 years,

dated Feb. 19, 1839, for *a new process for preventing the breaking of silk in winding*, April 29, 1839.

66. Touboulic, P., addition to patent for 15 years, dated Dec. 22, 1838, for *a system of aerial conveyance*, April 29, 1839.

67. Boisselot and Son, 5 years, for *a piano called "eledi harmonique,"* May 6, 1839.

68. Colin, P. J. G., represented by Perpigna, 15 years, for *improvements in sugar-moulds*, May 6, 1839.

69. Dogliani, Siméon, 15 years, for *a new apparatus for superposing sugar-loaf moulds*, May 6, 1839.

70. Gateau, J. B., and Deon, P. J., 5 years, for *an acoustic apparatus*, May 6, 1839.

71. Havard, N. and J. M., 10 years, for *water-closets adapted to public places*, May 6, 1839.

72. Kingdom, W., represented by Perpigna, 15 years, for *improvements in the escapements of watches, clocks, and time-pieces*, May 6, 1839.

73. Legouge, A., 10 years, for *a new system of wood-paving, and a bituminous composition*, May 6, 1839.

74. Périnet, E. F., 5 years, for *improvements on the cornopia, which are applicable to trombones, horns, trumpets, and other brass musical instruments*, May 6, 1839.

75. Petit, J. C., addition to patent for 15 years, dated Oct. 31, 1836, for *an inlaying and sculpturing apparatus*, May 6, 1839.

76. Alexandre, J., 5 years, for *a new musical instrument called "concertina,"* May 11, 1839.

77. Barbeau, jun., P. L., 5 years, for *a new system of land sluice or spiral cylindrical wells for railroads, valleys, mines, drying marshes, &c.*, May 11, 1839.

78. Cavallier Lions, H., addition to patent for 10 years, dated May 12, 1838, for *an improved stove for suffocating silk pods*, May 11, 1839.

79. Cyboulle, N. D., and Pladis, J. B., 5 years, for *a machine for bending cold bar-iron*, May 11, 1839.

(To be continued.)

CASE OF PATENT LAW.

AMENDMENT OF SPECIFICATIONS.

In the Rolls' Court, on Friday and Saturday, a case was heard of much importance, relative to the amendment of specifications.

It came before the court upon the petition of Joshua Wordsworth, praying that certain amendments which John Sharp had procured to be filed as a part of his specification might be taken off the rolls of the court, and that he might pay the costs of this petition. It appeared that John Sharp, in 1836, obtained letters patent for converting rope into tow, and for preparing cotton and other fibrous materials; a specification of this patent was duly enrolled.

By statute 5 and 6 William IV., c. 73, "to amend the law touching letters patent for inventions," it is enacted "that any person having obtained letters patent for an invention, may enter with the clerk of the patents (having first obtained the leave of the Attorney or Solicitor General) a disclaimer of any part of his specification, or a memorandum of any alteration therein, which is to be deemed part of such specification." Wordsworth's petition stated that letters patent were granted in October, 1836, to Sharp, to make and vend his invention, part of which the petitioner stated was applicable to the preparing cotton, wool, and silk for spinning. The specification was enrolled in April, 1837. In May, 1838, letters patent were granted to the petitioner Wordsworth for an invention or improvements in machinery "for heckling and dressing flax, hemp, and other fibrous materials," and in November following the specification was enrolled. The petition then stated, that after this enrolment he (Wordsworth) discovered that Sharp had, in September, 1838, obtained from the Solicitor-General a certificate that Sharp had applied for leave to enter with the clerk of the patents certain memorandums of alterations of parts of his specification, and that the Solicitor-General had directed him to advertise the alterations, which was done; and, no objection having been made, the Solicitor-General granted leave to Sharp to file the memorandum of alterations, which alterations the petitioner stated were a new arrangement of machinery, and extended Sharp's patent to what were in substance his (Wordsworth's) inventions, as described in his specification. The petitioner submitted that the statute did not authorise the addition to a specification of any description of new machinery, and prayed for expunging the memorandum of alterations.

For the petition it was argued by Mr. Pemberton and Mr. James Russell, that the Master of the Rolls (in whose custody the rolls of the Court of Chancery were) had authority to permit alterations to be made in the rolls, and his jurisdiction for that purpose remained unimpeached by the act of William IV. To exclude the jurisdiction of this court there must be an express legislative exclusion; and the mere giving an authority to another tribunal would not have that effect. The rolls of this court were under the control of the Master of the Rolls, and the state in which the records ought to be was subject to his determination, which must control the opinion of the Solicitor-General. The memorandums of alterations were filed with the specification, and became part of it. Had there been an alteration by erasure and substitution of other words, a difficulty would have been created; but there was no difficulty here in ordering the memorandum to be taken off the rolls. He did not contend that his lordship could order a patent to be taken off the rolls of the court on the ground that the invention was not new, but whether his lordship was to decide whether such circumstances had existed as could justify the memorandum being put upon the rolls. The question was not to be determined by the law officers of the crown without the control of any other authority. The act had not declared their fiat conclusive, nor had it extended any right given by the letters patent. The Legislature prevented the record being altered at the mere will of the parties, enacting that there must be the leave of the Attorney or Solicitor-General. If the fiat were conclusive, the alterations could not be averred to be no part of the record, for the statute had made them part of the record so long as the fiat remained. Unless the court had jurisdiction, the fiat would, in altering the records of the court, be conclusive not only against the court, but against the Attorney and Solicitor-General themselves, for the act had not provided a mode of amending any mistakes they might have been led into.

Mr. Hill and Mr. Bacon, for Mr. Sharp, against the petition, said the arguments for the petition were, that the specification with the alteration was a record of the court, that such records might be amended by his lordship, that the prayer was in substance for an amendment, and that the petitioner had that interest in the question which authorised him to make the application. The specification with the alterations might for many purposes be a record, but under the color of that general term inferences not quite sound had been drawn. The patent was granted upon a proviso that the patentee should at a certain time enrol a specification; but that proviso did not give the specification any of those high attributes of records which had been claimed for it. A record imported verity, and if the petitioner's argument was well-founded, no person could defend an action in which the patentee could prove an infringement of his patent. But from the statute of James I., these records had been treated only as the statement of a party who was bound to prove every averment he made, as that there was an invention, that he was the first inventor, &c. The patentee could not hold up his specification, and say, "Here is a record, you are estopped from saying I am not the first inventor; my case was determined before we came into court." Nothing of that sort could be said. The specification was not a record in the sense and for the purposes for which that word had been used, nor was the memorandum incorporated in the specification such a record. His lordship had been required to erect the court into a court of appeal over judgments of the Solicitor-General, and to do what that officer might have done had he viewed the matter in a different light. Such a procedure would not come within the doctrine of amendments. Before the statute of William IV. there was no authority that could enable a patentee to disclaim any part of his patent; it was a new power given to the crown, and vested in its legal officers. By the common law the crown had great powers in granting monopolies, which by the statute of James were restricted to new inventions, and to the term of 14 years, and where the patentee by his specification had made his claim too large, it was fatal to his patent; but the late act had given the Attorney-General power to permit the patentee to disclaim a portion of his patent. When a power was created by the legislature, and vested in a certain tribunal, then no other court had jurisdiction. The invention was only one condition—the inventor must have a patent and specification. The memorandum remaining on the files of the court decided nothing but that the memorandum was authentic; it did not decide that there was an invention, or that the patentee was the inventor. The alleged invention might not be new, but that would be no reason for taking the memorandum off the files of the court. The argument for the petition went to change the whole course of proceedings in patents from the time of James I., and he would advise his friend, who was the inventor of the doctrine, to get a patent for it. Whether it would stand as a new machinery for trying the validity of patents by their specification before the Master of the Rolls, would be a question. It was said that whatever had any vice would be taken off the rolls of the court, which would not bear anything on its rolls which contained an erroneous allegation. The question was, who was the new inventor? An issue could not be granted to determine the question of amendment. The Solicitor-General required advertisements to be made of the application to him, and gave it two hearings; so that the fiat for filing the memorandum of alterations was not granted in haste, but after due consideration. The validity of patents ought not to be decided in the present mode of proceeding. The mode of trying these questions had been settled for years, and ought not to be altered.

Mr. Pemberton replied. As long as the memorandum of the alterations with the fiat of the Solicitor-General remained as part of the rolls of the court, it would not be competent for any person to deny that the memorandum was a part of the specification on which the patent was granted. The statute did not authorize the memorandum to be placed on the rolls, for the memorandum did not form part of the specification. He would ask, had the crown granted letters patent with the alteration? If it had, the objection that his lordship had no power to interfere would be good; but if the memorandum were improperly placed, then it formed no part of the grant, and his lordship could remove it from the record, as he could remove a forged specification or correct a clerical error.

Lord Langdale said, it was his duty to receive the records of the court, and in his character of recipient he had no doubt of his jurisdiction. He was to receive such documents as parties presented as the records of their own acts. If it were shown that documents had been presented which were not an accurate record, it would be his care to discover where the error arose, and to satisfy himself that it was an error. He would see what had been done upon former occasions.

Mr. Pemberton—The question was not whether his lordship could alter a record, but whether the enrolment as it stood was a record.

Judgment was postponed.

COPYRIGHTS OF DESIGNS.

(Continued from No. 67.)

NO. OF DESIGN.	DATE OF DEPOSIT.	NAME OF PROPRIETOR.	SUBJECT OF DESIGN.	DURATION OF COPYRIGHT.
	1840			
305 to 306	8 May	Wm. Ryton and Benjamin Walton	Dish Cover	3 years.
307	11	Charles Griffin	Kite (Metcorological, &c.)	1 "
308	11	David Wilkinson	Reel	1 "
309	12	Septimus Cockings	Metallic Pens	3 "
310	15	Joseph S. Hall	Boot	1 "
311	19	Frederick Gye	Letter Balance	3 "
312	20	Thomas Ellis	Reflector	3 "
313 to 315	26 and 27	Wm. Ryton and Benjamin Walton	Dish Cover	3 "
316	27	Butcher, Smith and Co.	Carpet	1 "
317	28	James Yates	Stove	3 "
318	28	Henry Tuck	Envelope	1 "
319	29	Daniel Walton	Lace-hole	3 "
320	29	Joshua Nettleton	Stove	3 "
321	4 June	Charles Griffin	Weight Balance	3 "
322	4	Wm. Joseph Curtis	Railway Bolster	3 "
323	5	Joseph Saunders	File	3 "
324	5	John F. Stephens	Tailors' Square	3 "
325	8	Pershouse and Welch	Snuffers	3 "
326	8	John Dry	Shaker for Corn-dressing Machines	3 "
327	9	A. Solomon and Son	Embossing Cloth	1 "
328	9	Richard and J. D. Chambers	Door Lock and Key	3 "
329	11	John Isaac Hollingshead	Pens	3 "
330	11	Ditto	Pen-holder	3 "
331 to 332	15	Selby and Keartland	Fastenings for the Straps of Trowsers, &c.	3 "
333	15	The Coalbrookdale Company	Stove	3 "
334	15	Charles Brown	Vase	1 "
335	16	Bamfield Renno	Draught Eyes or Tugs of Hames for Horse Collars	3 "
336	16	Jackson and Jowett	Back-straps for Waistcoats and Trowsers	1 "
337	18	Gabriel Riddle	Fountain Ink and Taper-light Stand	1 "
338	19	James Dixon and Sons	Powder Flask	3 "
339	19	Henry N. Turner and Co.	Stained Paper	1 "
340	22	Geo. D. Dempsey	Candle Socket	3 "
341	22	G. and H. Talbot and Sons	Carpet	1 "
342	23	Wm. Ponsford	Envelope	1 "
343	24	Dixon and Sons	Coffee Pot	3 "
344 to 345	26	Jno. Roshon	Gambroon	1 "
346	29	Samuel Lowe	Carpet	1 "
347	30	William H. Phillips	Chimney top	3 "
348	1 July	Henry Longden and Son	Stove	3 "
349	1	Peter Wright	Axle-cap, Washer for Vices	3 "
350	1	Wm. J. Stone	Label	1 "
351	2	W. Beach	Spring for Cricket Bats	3 "
352	2	James Bell	Bruising and Grinding Machine	3 "
353	6	Sampson Mordan, sen.	Pencil Case	3 "
354	7	Woodward, Gandell, and Co.	Carpet	1 "
355	15	Wm. Woods and Sons	Penholder	3 "
356	20	The Carron Company	Stove	3 "
357	20	Samuel Ackroyd	Fender	3 "
358	20	Ditto	Stove	3 "
359	20	Ditto	Fender	3 "
360	21	Emerson and Joseph Dowson	Balcony Front	3 "
361	23	Spilsbury Butler	Herculean Cord	3 "
362	23	Edward H. Barwell	Stove	3 "
363	23	Robert Hardy and Robert Padmore	Lion	3 "
364 to 365	27	James Yates	Fender	3 "
366	27	Jsaac Jno. Hollingshead	Pen	3 "
367	27	Ditto	Pen holder	3 "
368	27	Butcher, Worth, and Holmes	Carpet	1 "
369	28	Thomas Grim	Water-closet	3 "
370	30	Samuel Ackroyd	Fender	3 "
371	30	Kennard, Staite, and Co.	Tomb and Balcony Railing	3 "
372 to 374	31	Geo. Jackson and Sons	Ornaments for Glass Frames, &c.	1 "
375 to 376	3 August	Ibotson and Jno. Walker	Gambroon	1 "
377	3	Griffiths and Hopkins	Dish Cover	3 "
378	7	Wm. Crook and Son	Stove	3 "
379	7	Ditto	Fender	3 "
380	7	Henry Jackson	Letter Balance	3 "
381 to 382	12	Henry N. Turner and Co.	Stained Paper	1 "
383	12	Lea and Co.	Carpet	1 "
384	13	Thomas Eagland	Instrument or Couch for Extension of the Knee-joint	1 "
385	17	Carron Company	Stove	3 "
386	17	Benjamin Walton and Co.	Ornamental Handle	3 "
387	20	James Richmond	Chaff-cutting Machine	3 "
388	20	James Cockran	Thrashing Mill	3 "
389 to 390	21	Wilcoxon and Sons	Stained Paper	1 "
391	24	Lea and Co.	Carpet	1 "
392	24	Coalbrookdale Company	Hat, Coat, and Umbrella-stand	3 "
393	25	Samuel Ackroyd	Fender	3 "
394	28	Robert Rettie	Gridiron	3 "
395	31	Thomas Messenger and Sons	Lamp Chimney	1 "

FOREIGN INTELLIGENCE.

FRANCE.

The method discovered by M. Jacobi, of procuring by means of electricity convex impressions, or impressions in relief, similar to the outline of a given model, continues to be applied in France with success. This process, to which M. Jacobi has given the name of *plastic galvanism*, consists in decomposing, by means of an electric current, a solution of sulphate of copper, in which the mould that receives the impression is placed. The moulds may be of metal, of wax, of wood, of plaster, or even of stearine. When M. Jacobi makes use of a mould that is not metallic, he covers the surface of it with graphito or plumbago. The process of M. Jacobi has already been turned to considerable advantage in Russia, in those manufactories where articles of luxury or of domestic use are manufactured. It has also been applied by its inventor to reproduce the photogenic image formed in the Daguerreotype. M. Jacobi makes use of one of the metallic plates on which an image has been obtained by the process of M. Daguerre, as a mould in the apparatus where the galvanic reduction of copper is effected. After 24 hours' exposure to an electrical current he has obtained a galvanic tableau with a distinct impression of the photogenic image. Methods similar to these have been employed by M. Bocquillon in Paris to produce very extraordinary metallic moulds from the printed impressions of vignettes, &c., and the attempts at copper-plate engravings by means of this process which M Richoux has just presented to the French Academy show a degree of neatness and finish that is inferior to nothing of the kind which has been undertaken.

BELGIUM.

ROYAL DECREE FOR PROVING STEAM-ENGINE BOILERS.

By a decree of King Leopold, dated Oct. 28, it is ordained:—

"That every boiler in which the steam is required to have a pressure of more than one atmosphere shall be submitted to a proof of treple the force it will be required to support. This pressure to be determined by the difference between the authorised pressure of the steam in the boiler and atmospheric pressure.

"Considering that tubular boilers of locomotive engines may safely be exposed to less rigorous proof, on the report of our Minister of the Public Works, we have decreed,

Article 1.—That the boilers of locomotive engines intended to run on railroads shall be submitted to a proof of twice the amount those engines are required to support.

"Art. 2.—The permission to make use of locomotives belonging to the state will be granted after the trials prescribed by the articles of the first and second decree, by the director of the railroads now in operation.

"Art. 3.—The proof of the locomotive engines shall be renewed at least once a year; they shall take place after every important repair of the boiler. The boilers that are injured during the proof shall not be used.

"Art. 4.—The director of the railroads in operation shall address to our Minister of the Public Works a duplicate of the permission to use the engines, and of the declarations of proof."

The following notice respecting the future authorisation of public companies is contained in the official part of the *Moniteur Belge*. "The Minister of the Interior having had cause to remark that the rules and principles admitted by Government with respect to anonymous societies, render it continually necessary to adopt modifications or additions more or less numerous to the acts containing the statutes which are submitted to the royal sanction, and considering that serious inconveniences result from it, both to those who are personally concerned as well as in the manner of arranging the business, requires those who may wish in future to obtain the royal grant for the formation of such societies, in the first place merely to make a simple proposal to Government, not in an authentic form, but supported by a request signed by all the shareholders, and accompanied with all the necessary documents and explanation calculated to render the foundation and importance of such an establishment appreciated.

The amount of the town dues of Brussels during the first six months of the present year have exceeded those of the corresponding period of last year by 39,000 frs. This increase, though great, is not so large as might have been expected, when it is considered that the first six months of 1839 were occupied with political agitations, and that in this year the most perfect tranquillity has been preserved. It is supposed that one cause of the receipts not being greater is the increasing frauds on the town dues by smuggling.

Mr. Babbage, the inventor of the celebrated calculating machine, has recently been in Brussels. The few persons who have been admitted to see the plan of his new machine are unanimous in acknowledging that it is quite as extraordinary in its effects as the electrical telegraph of Mr. Wheatstone.

RAILWAY INTELLIGENCE.

DOMESTIC AND FOREIGN.

North Midland.—Traffic returns for the week ending 31st October:—

Passengers, parcels, carriages, horses, and mails	£2,369 14 2¼
Merchandise	624 2 2
	£2,993 16 4¼

Perambulating Police on the North Midland Railway.—A few days ago, this force was set in action along the whole of the North Midland line. It consists of fifteen men and five inspectors. Each man has a beat of four or five miles, and it is his duty to see that the workmen remove all their implements out of the way, that the line is perfectly clear, and to apprehend trespassers. Sir Frederick Smith has been down to investigate the cause of the accident at Amber Gate on the 13th of Sept., when Deneux was killed; and we understand that his report thereon has been transmitted to the Board of Trade.—*Sheffield Iris.*

Bristol and Exeter.—The works between Bristol and Bridgewater are proceeding very favorably, and the line is nearly ready for the permanent rails. The whole of the timber for the longitudinal bearings is on hand, and immense wrought iron tanks have been manufactured for Kyanizing it. The bridge to connect the terminus is advancing fast to completion, and will be an imposing piece of masonry. We understand that the directors fully expect to have this portion of the line ready for traffic in the course of April or May next.—*Bath Journal.*

A railway is projected between Newport and Gloucester, taking the circuit of Monmouth and Usk.

The South Western.—A circumstance of no slight importance, and one that seems to demand investigation, has recently taken place in the affairs of this railway. It is now certain that Mr. Easthope has resigned the chair of the direction. It is stated (with what truth we know not), that his resignation has been occasioned by a difference of opinion between himself and his colleagues, and some of the officers of the establishment, as to a system of management which he deemed essential, as well to the interests of the company, as to the public safety. However this may be, we think that Mr. Easthope will be guilty of great omission if he do not state to the public plainly the grounds upon which he has felt compelled to retire from the management of an undertaking in which from its origin he has been so prominently identified.—*Wiltshire Independent.*

A Foreigner, named Rudolph Ohrtman, was convicted by the magistrate at Marylebone police court, on Monday, for smoking in one of the second class carriages of the Great Western Railway, and was fined 20s. and costs. The defendant and several other foreigners got into the up-train at Slough, and commenced smoking cigars. The guard remonstrated, but instead of attending to him they puffed the smoke in his face. The defendant was the only one whose name and address was obtained, as the rest of the party escaped when the train arrived at the Paddington terminus. Mr. Hazard, a wine merchant in Cannon-street, City, was a passenger in the carriage, and observed that the conversation of some of the party from Slough to Paddington was very disgusting; so much so that two ladies who were sitting by them were under the necessity of being removed to another carriage in the train; if there was no clause in the act by which persons could be brought to justice for grossly indecent conversation while travelling by railway, he thought that the public press would render an essential service by taking the matter up. Mr. Rawlinson thought one of the by-laws which related to "any person conducting himself improperly," &c., was applicable to the case.

RAILWAY ACCIDENTS.

Accident on the Dublin and Kingstown.—When the half-past seven o'clock train on Sunday morning had reached Sandymount Avenue, the axle of the engine "Dublin" gave way, when the train was thrown with great violence off the rails. The engine upset, and most of the second class carriages were smashed to pieces. We are happy to add that no person sustained the slightest injury. The engineer was thrown with violence under the engine, but fortunately escaped, having been removed from his perilous situation, unhurt.—*Dublin Evening Post.*

Accident from Explosion of a Boiler.—Two Lives Lost.—Yesterday evening, at ten minutes before six, a locomotive engine, once well known at the Vauxhall station, Grand Junction Railway, as Dr. Church's engine, while standing over an ashpit at the Broomsgrove station, blew up with a terrific explosion. Thomas Seaife, one of the drivers of this railway, who was by chance on the engine speaking to the driver, was struck dead on the spot. The foreman of locomotives, J. Rutherford, died this morning (Wednesday) from the effect of the scalds which he received at the time of the accident. The stoker and one of the breaksmen on the incline were seriously scalded, and several others are also slightly hurt. As neither Dr. Church nor its present proprietor is as yet come to this station, it has been considered proper not to examine the engine, and therefore no cause for the accident can be stated with sufficient accuracy. This engine was not employed on the line for the purpose of running trains, but had been permitted to come on trial, having been slightly altered since its previous trials on other lines.—*Worcester Journal of Thursday.*

Cause of the Accident on the North Midland.—Our readers will recollect that on the occasion of the late occurrence on the North Midland railway, we expressed some doubt as to whether the accident had really arisen, as was generally alleged, from a defect in the axle, which was found broken—although we bowed, as we were bound to do, to the decision of the coroner's jury. In the course of the present week, the Horseley Iron Company, the manufacturers of the axle referred to, have publicly denied the imputation cast upon them by the verdict of the jury; and we understand that the Government Commissioner has, in his official report, expressed an opinion that the fracture of the axle was not the *cause*, but the *consequence*, of the carriage having run off the rails. Under these circumstances, the public will do well to suspend their judgment; it is quite clear that

the matter cannot rest where it is. At the same time, it is right to state that within the last few days *another* axle of one of the North Midland Company's carriages broke while passing over the London and Birmingham line, although fortunately no serious consequences ensued. We learn, too, from undoubted authority, that previous to this second accident, the North Midland directors had given orders for the removal *from every carriage* of axles manufactured by the Horseley Iron Company, and that the order is now in course of execution.—*Railway Times.*

Novel Action against a Railway Company.—The *Scottish Guardian*, published at Glasgow, gives an account of a successful action brought in the Sheriff Small Debt Court of that city, against the Glasgow and Ayr Railway Company, for damage sustained owing to the company not having conveyed him to his destination by the time specified. The circumstances of the case are these:—On the 5th of September last a person took out a ticket at the office of the Glasgow, Paisley, Kilmarnock, and Ayr Railway Company to be conveyed to Ardrossan by the train which left Glasgow at four o'clock on that day. From Ardrossan it was his intention to have proceeded to Arran by a steamboat, which left that place at six o'clock. He had calculated that he would be enabled to reach Ardrossan in sufficient time to be put on board a steamer for Arran, from advertisements which had been issued by the railway company, holding out to passengers that they might reckon upon being conveyed at the rate of a mile in three minutes, stoppages included. From some cause or other, however, the train only reached Kilwinning at five minutes to six o'clock, and this delay, it was sworn by the complainant's witnesses, arose from no accident, but, as they understood, from the want of proper fuel, common coal being used in place of coke. The average rate at which they travelled was about twelve miles an hour. On arriving at Kilwinning the carriages containing the passengers for Ardrossan were detached from the principal train, which then proceeded on to Ayr. By this time, however, the branch train for Ardrossan had left, and the passengers in the detached wagons were left standing outside the line, no notice whatever being taken of them by the company, or their servants. In these circumstances the complainant, and some others, hired a car, in which they proceeded to Ardrossan, but the steamer had sailed before their arrival. He was, in consequence, detained in Ardrossan till the next Monday morning, and he brought his action against the railway company, 1st., for the proportion of the hire of the car; 2d., for the expenses of his living in Ardrossan till the Monday; 3d., for remuneration for the loss of time, occasioned by his being kept from his business on Monday; and 4th., for the price of some perishable articles, which had been spoiled by being kept. The defendants concluded that they were only liable at the utmost for the hire of the car; that this was the only direct damages he had suffered; and that to award any farther sum would be to give consequential damages, to which there would be no end. The Sheriff held that gross carelessness on the part of the company had been proved, and he found the complainant entitled, first, to the hire of the car; and second, to the expenses to which he was put in living at Ardrossan till the Monday morning; but as to the loss of time, for that the complainant was not entitled to compensation, seeing that had he succeeded in reaching Arran on the Saturday night, as he intended, Sunday would have been a lost day at any rate.

REPORT OF THE GOVERNMENT COMMISSIONER ON RAILWAYS.

The report of the commissioner appointed by government to inquire into the causes of the late fatal accidents on the Hull and Selby and North Midland railways, has been published by the *Railway Times.*

Lieut. Col. Sir Frederick Smith, the commissioner appointed, in this report attributes the first accident on the Hull and Selby railway, on the 7th August, which was caused by an iron casting falling on the rails from a truck in advance, entirely to "great and unpardonable neglect" in the parties whose business it was to see that the casting was properly secured. The commissioner recommends that all the articles contained in goods carriages should be enclosed within a substantial frame-work, and not fastened by ropes to open trucks. He expresses a doubt whether it is advisable to place an empty truck between the tender and the first passenger-carriage, because the want of weight in the empty truck might cause it to jump off the rails at high velocities, and draw the carriages after it. The second accident, on the Hull and Selby railway, on the 7th September, owing to the speed of the engine not being checked in sufficient time as it approached the terminus, is attributed to two causes: "first the want of experience, judgment, and prudence in the engineman, Daniel Ledder; and secondly, to there being no break to any of the carriages of the train." Ledder, it appears, had been for some years employed at a locomotive manufactory of the Manchester and Liverpool railway, but until the opening of the Hull and Selby railway he had never driven a passenger train, and that he had only three weeks' previous experience as an engineman on that line by having driven a ballast engine for that time.

Having reported on the causes of the two accidents more immediately the subject of investigation, Sir Frederick Smith proceeds to state his opinion, as required by the Board of Trade, on "the precautions proper to be taken in order to guard against the recurrence of similar disasters." This constitutes the most valuable part of the report; from which we make the following extracts:

"In the first place I have to state that it appears to me that the judicious selection of enginemen would, perhaps, more than almost any other circumstance or arrangement, tend to promote the safety of passengers; and we have seen by the account of the accident last under consideration, that sufficient caution is not invariably used in such selection; for although Daniel Ledder is represented to be a young man of exemplary conduct, steadiness, and of much promise, still it is evident that his experience as a locomotive engineman was hardly sufficient to warrant his being employed to drive a passenger train. I have reason to believe that this is not a solitary instance of the employment of unskilful persons as enginemen, and it is to be feared that the further the railway system is extended, the greater will be the facility for inexperienced men getting employed in these highly important situations. Therefore, although I have great reason to hope that the recommendation of your lordships will be received by the railway companies in general in such a spirit as to supersede the necessity of positive enactments, still in the case of regulating the nature of the qualifications for enginemen, I think the interference of the legislature would be hailed not only by the public for whose safety it is required, but also by the railway directors, who would thereby be relieved from a very heavy responsibility. In my opinion no person should be allowed to drive a locomotive engine for passenger trains who has not undergone a strict examination, and proved his competency for that duty, before some properly-constituted board.

"This appears to me to be as important a measure as the examination of pilots, and it will be easy to devise a method of examining and licensing persons for enginemen.

"Such an arrangement, while it would tend materially to increase the safety of railway travelling, would also raise the standard of these men, and in all probability lead to a better class of persons turning their attention to this employment, the wages of which already hold out considerable temptations.

"Several companies present inducements to their enginemen to be regular in their conduct, to endeavor to acquire mechanical knowledge of the locomotive engine, and to increase their general fitness for the duty they have undertaken; and prizes are given for punctuality in driving, and for keeping their engines in sound order. These are commendable and judicious systems, *but what the public are entitled to expect is, that their safety is not entrusted to any but skilful drivers, and I see no other means of ensuring this but by the drivers being licensed.*

"The next point on which I have to offer a few remarks is the application of the 'break.'

"Not only would its judicious use often lessen the extent of an accident, if not wholly prevent it, but its improper application might fearfully increase the evil. Hence the position of the break is of vast moment to the safety of the train, and it is of equal importance that its management should be entrusted to a man of judgment and decision. I am of opinion that in most cases the proper place to use the break is on the hinder passenger carriage. When thus applied it has the power of checking and retarding the velocity of *all* the carriages to almost any degree that the 'breaksman' may desire, but if attached only to a *forward* carriage, the velocity of all those behind it would remain unchecked, and they would rush upon the break carriage.

"In cases where high speed is used on descending planes, serious consequences might result from such an arrangement. Let it be supposed for example that the middle carriage of a train is the only one provided with a break, and that by the fracture of an axletree, or some other cause, one of the carriages behind the break is thrown off the rail, there would be no sufficient means of preventing such carriage from being followed by the hinder part of the train.

"Had there been a break properly applied on the end carriage of the Hull and Selby train of the 7th August, there can be very little doubt that the accident of that day would have been far less disastrous in its consequences, and in all probability would not have extended to the carriages in which the loss of life occurred.

The guard, William Greaves, was on the first carriage, which had a break, but he was occupied at the time the accident occurred in ascertaining what passengers were to be left at the Howden station, and therefore was not attending to the course of the train; but, had it been otherwise, the suddenness of the accident would have prevented the break being used on a carriage at the head of the train—though it could not have failed to be very serviceable on the hinder carriage.

"It is scarcely necessary to mention, that if a break had been applied on the hinder carriage of the Hull and Selby train of the 7th September, it would have entirely prevented the accident which happened on that day.

"I have frequently observed that due attention is not given to the position in which the break carriage is placed, and it is not uncommon to see trains without any break carriage whatever. Indeed in my journeys to investigate the causes of the accidents now under consideration, it happened that I travelled with two trains in which there was no break carriage. This I consider to be very unsafe, and the public should not be exposed to such risks.

"I would suggest, as a general rule, that no train should be permitted to leave a station without being provided with one or more breaks; and in passenger trains a fair proportion would be one to every third carriage. The principal guard should be upon the last carriage of the train, which should have a break; and the station of the under-guard should be upon one of the intermediate break carriages.

"This is the least that the public have a right to expect on this important head, and I would recommend that the matter should be pressed upon the consideration of the railway companies in general, though I should observe, that on some of the great lines the attention of the management is directed to this point.

"I have further to suggest that buffer-springs should be adopted for *every* carriage, wagon, truck, or horse-box used on railways.

"I am very unwilling to offer a suggestion that might in any way fetter the railway managements, but as I am told at the principal stations that each carriage undergoes an examination at the end of

every journey, for the purpose of discovering any unsoundness, should it exist, I do not think it is too much to expect that the carriage-inspector should enter, in a book to be kept in the office of such principal stations, the number of every carriage he examines, with an observation as to the soundness or otherwise of each. This will prevent the inspection becoming rather one of form than of utility.

"It is no more than justice to the directors and managers of the Hull and Selby, as well as of the North Midland Railways, to state that they manifest the most earnest desire to leave no means untried for ensuring the safety of travellers on their respective lines, and to deserve the confidence of the public. I particularise these two companies, because it is alone with them that my present investigation has placed me in official communication. But I cannot refrain from stating here that I have observed the same feeling also predominant in the civil engineers, and other gentlemen connected with the various railways, over which I have travelled a great number of miles in the course of the investigation in which I am now employed, to test the relative merits of the competing lines to Ireland and Scotland."

GENERAL COMMISSION AND PATENT AGENCY FOR IRELAND.

WE beg to recommend our AGENT for IRELAND, Mr. RICHARD TELFORD, 109, STEPHEN'S GREEN, DUBLIN, as the most eligible person whom PATENTEES can employ for the sale of their articles in Ireland. He has a most extensive and respectable connection, and his house is well known as a depôt for patent goods, inventions, &c. We have no doubt of his efficiency to promote the interest of those parties who may favor him with their business.

Mr. TELFORD also undertakes every description of Patent Agency business for Ireland.

TO CORRESPONDENTS.

GRATUITOUS COPIES *of our Journal have been forwarded to a number of Individuals interested in some Patent or Invention, of which notice has been taken in our number of to-day.*

"THE INVENTORS' ADVOCATE" *is published every* SATURDAY MORNING, *at* 7 O'CLOCK; and is regularly issued in MONTHLY PARTS, of which 1 *to* 17 ARE NOW READY.

"THE INVENTORS' ADVOCATE" is also published in Volumes containing the Nos. of every 6 months.

Vols. 1 and 2, handsomely bound, are already published.

If M. N. *will send a short corrected description of his invention, it shall be inserted with pleasure; if not, we will endeavor to supply the omission of which he complains, next week. The difficulty of procuring correct descriptions of specifications may be conceived, when it is known that, from some unaccountable cause, no notes are allowed to be taken on perusal. We presume the fee system is the stumbling block to the correct knowledge of specifications, as it is to the obtaining of Patents.*

We wish "E. M." *would put his speculations in a form for publication, and we should be glad to give our readers the advantage of them. We certainly cannot make the admission which he takes for granted.*

TO CAPITALISTS, MANUFACTURERS, AND TRADERS.

Among many VALUABLE INVENTIONS *and* PATENTS *registered at the* PATENT OFFICE, BRITISH and FOREIGN, (198, STRAND), *for the investment of capital, Shares are offered for sale in the following Useful Inventions:—*

A Fire Escape of Novel Construction, which may be used as an Observatory.

A Cheap Lamp for burning Tallow and Grease, without overflow or smelt.

Patent Screw Jack, for lifting locomotives and other great weights.

An Improved Balance, applicable to small or great weights.

Important Improvement in Wood Paving.

A New and Improved Method of Burning Coke.

New Methods of Purifying and Treating Oils.

A new System of Clock-making.

Patent Forge Back.

A new Castor for Furniture.

Patent Process for the Manufacture of Soda.

Improved Methods of Building Iron Ships.

The Purification of Gas.

Improvements in Soap-making.

TO INVENTORS.

PERSONS WHO WISH TO OBTAIN OR DISPOSE OF PATENTS, *or to bring* NEW INVENTIONS INTO USE, *are requested to apply to the* PATENT OFFICE, BRITISH and FOREIGN, No. 198, STRAND, *opposite St. Clement's Church, where they will meet with great facilities to obtain information and to carry out their views.*

THE GALLERY OF INVENTIONS,

Attached to the Patent Office, is a spacious Saloon, well lighted, in which Plans and Models are exhibited. It affords an excellent medium for bringing New Inventions into public notice.

THE

INVENTORS' ADVOCATE,

AND

JOURNAL OF INDUSTRY.

SATURDAY, NOVEMBER 14, 1840.

*** *The Office for the publication of* THE INVENTORS' ADVOCATE, *is removed from Tavistock Street, Covent Garden, to the Patent Office, British and Foreign,* 198, *Strand; opposite St. Clement's Church.*

The speech of the King of the Belgians, on the opening of the session of the Chambers on Tuesday, exhibits a pleasing contrast to the generality of royal speeches on such occasions. These documents usually contain so little relative to the manufacturing and trading interests of the community, as to be beyond the sphere of notice in our journal; but in the speech of King Leopold, those subjects form a most conspicuous place.

We wish the example of Belgium were followed in England, and that more attention were paid by the government to its vital interests. The following passages from King Leopold's speech, show what importance is attached to the manufacturing industry, the promotion of public instruction, and the improvement of the means of communication throughout that kingdom:—

"The benefits of an abundant harvest begin to be felt by the laboring class; they will advantageously aid the interests of our industry, some branches of which require facilities which I shall always have at heart to procure. A new bill on agricultural produce will be submitted to your consideration.. The labors of roads and bridges are actively carried on. The national undertaking of railroads is the object of every attention on the part of the government. New sections will soon be ready for communication, and the time is not far distant when Belgic lines, joining the lines of Germany and France, will multiply and facilitate our relations with those two great countries. During the last ten years Belgium has made wonderful efforts towards the improvement of her means of communication. The navigable routes have had, however, but a small share in this great movement: in this respect much remains to be done, and the government will neglect nothing in successively realising the ameliorations it has in view. If the country has signalised herself by the development of her material interests, you have also had evidence of her progress in intellectual labors. The fine arts in particular have shed a lustre. I call your attention to the necessity of completing the organisation of public instruction. A patriotic spirit of union and conciliation will, I doubt not, preside at the examination and the solution of the questions connected with this subject."

The report of the Commissioner appointed by Government to inquire into the causes of some of the recent accidents on railways, and to state his opinion of the means proper to be adopted to prevent their recurrence, from which an extract is given in another column, is very ably drawn up It is written in a spirit both firm and conciliatory as relates to the management of railways, whilst it exhibits an earnest desire to protect the public from the consequences of carelessness, neglect, or want of due caution. With respect to the causes of the two accidents on the Hull and Selby railway, little additional information could be expected from the personal inquiries of the commissioner, beyond what was elicited by evidence before the coroner's jury. Great want of care in fastening on the iron casting which fell and caused the first calamity, was sufficiently manifest in the one case; and the inefficiency of the engineer, and the want of breaks to the carriages, were clearly apparent in the other. These are the conclusions at which the commissioner arrives in his report. He furnishes more additional evidence, however, respecting the incompetency of the engineer. It appears, that the only experience which he had had of the management of a locomotive engine, was three weeks' guidance of a ballast engine, before he was appointed to take charge of passenger trains. His previous knowledge of the construction of locomotives, though extremely valuable in the management of the engine, could have given him no practical acquaintance with the working of it on the road, nor with the regulation of the velocity of the train.

The fact of a person thus incompetent being appointed to so responsible an office, and the danger attending it, fully exemplifies the necessity which we have frequently enforced of having a superior class of engineers appointed. We are glad to find that the same recommendation is strongly urged by Sir Frederick Smith, the government commissioner. His suggestion, that all engineers should undergo a previous examination, and that those who have passed such an ordeal should be licensed, seems well calculated, as far as it goes, to effect great improvements in the character and efficiency of the men employed. Such a plan would, as the commissioner observes, be the means of raising the standard of that class, and would render the appointment to the office of locomotive engineer a desirable acquisition to many who now consider it beneath their consideration. We question, however, whether at present a sufficient number of men properly qualified and experienced would be found to supply the rapidly increasing demand. In this state of things, therefore, the plan we lately suggested, of appointing a superior officer to keep a proper look-out, and to give orders to the engineer, seems especially required. By thus placing the train under the charge of a captain, or pilot, the attention of the engineer would be confined to

the engine, and the whole responsibility would devolve on the officer, whose duty it would be constantly to look out for danger, and to issue his commands to the breaksman and engineer for its avoidance.

Numerous and lamentable as the accidents on railways have lately been, it is greatly in favor of this means of conveyance, that all, or nearly all, of these disasters have occurred not from any defect inherent in the system itself, but from the negligence or want of precaution in those who have had the conducting of the trains. These are casualties almost inseparable from the commencement of an operation so entirely new as rapid locomotion on railways by steam-power. They are unquestionably capable of remedy, and after experience, which is daily maturing, has shown the nature of the precautions to be observed, we may hope to see the system of railway communication freed from all its extraneous difficulties. The report of the government commissioner, to which we have now adverted, will, we trust, be the means of hastening the time when this desirable object will be accomplished.

NEW INVENTIONS.

NEW STEAM-BOILER.

Messrs. Turck and Carteron, mechanical engineers, have sent a long memoir to the French Academy, describing some improvements which they, after long experience, have been led to make in the boilers of steam-engines. The generator, more particularly, has been the object of their attention. They have contrived a new pump for feeding the boiler, also a manometer, which indicates more satisfactorily than those in present use the state of the water and steam inside the boiler, shows the amount of pressure of the steam, gives warning when it has arrived at a certain point, and removes of itself the excess of pressure. One of their most remarkable improvements consists in placing a second boiler inside the principal one; by which means the heating surface is greatly increased, and a very small quantity of water is kept boiling at a time. Not being able to enter minutely into the description of the apparatus without diagrams, we must confine ourselves to stating that these improvements have been made more especially with the view of preventing the adhesion of the globules of steam to the sides of the boiler; to assist their removal, and to bring the water in any quantity without danger into contact with the heated surface of the boiler; and, finally, to employ the heat communicated to the boiler in such a manner that it would be impossible for it to acquire a degree of heat much superior to that of the water and steam which it contains. By these improvements, the inventors conceive an explosion would be rendered almost impossible. The principal advantages to be attained by these contrivances of Messrs. Turck and Carteron are thus described by themselves:—First as to the generator. Circulation by ebullition, and the diminution of the mass of water; the friction of the water against the sides of the boiler; the prevention of the adherence of globules of steam; assisting the disengagement of them, and the mechanical division of the water by their interposition; the successive renewal, and by very small quantities, of the water in contact with the heated surfaces of the generator; the longitudinal amount of the water on its return; the circulation of the steam; the distinct separation of the steam from the water; the double reservoir of steam; the excess of heat in the steam to provide for the immediate vaporisation of all the water it contains, and for its cooling in the pipes and cylinders. As to the accessories: they consist in the certain supply of water to the boiler; the constant indication of the pressure; the warning when it is too great; the escape of superabundant steam; and the regulation of the fires.

A MAGAZINE GUN.

Several of the French papers have mentioned the invention of a gun by M. Philippe Mathieu, of St. Etienne, which fires six times with one loading. The following are some particulars respecting this remarkable invention. These guns have only a single barrel, one lock, and one trigger. Differing in appearance but little from ordinary guns, they are by no means inferior either in elegance and lightness to the most finished fowling pieces. These guns are also said to be more true in their fire, and less dangerous than the guns in common use. The six charges are independent of one another; so that one of them, or more, may be discharged and the gun reloaded before firing again; or the six charges may be fired in succession with astonishing rapidity. It is stated in the *Moniteur Parisien*, that one of these guns has been fired eight thousand times without any part of it having come out of order. The description of its peculiar action is not given in the French papers, from which this notice is taken, but if the gun performs half what is stated, it will produce a great change in fire-arms of all kinds, and constitute a most destructive instrument in warfare. A charge with bayonets would be rendered impracticable against troops armed with weapons which contained a reserve of six fires, to be discharged almost instantaneously in close quarters.

AN IMPROVED HOE.

The *Agricultural Annals* of Dordagne contain a description of a new kind of hoe, to be worked by a single horse, which will weed a hectare and 50 acres of land in the course of a day. The hoes penetrate the earth to a depth of from three to twelve centimetres (from one to four inches) at will, according to the different arrangement of the regulator. This agricultural implement has hitherto been most difficult to direct. Having no "purchase" on the ground, it usually diverged from its proper course by the smallest stone or the least false movement of the horses, and by that means frequently cut down a great number of the plants between which it worked. The hoe which is used at the model-farm of Salegourde has been improved by M. Lecbell. By means of a small alteration, trifling in appearance, but of which no one had previously thought, he has made the use of the horse-hoe as easy as it was before difficult. He has added a coulter before the middle hoe. This coulter by being fixed four or six centimetres lower than the hoes, enters deeper into the ground, and keeps the whole instrument in its right course. This instrument has also the advantage of being stronger than those in general use; it is, moreover, superior to them, owing to the form of its hoes, and to its regulator, which is a small moveable wheel placed in front. This instrument may be employed to weed all grounds where the plants are sown in furrows.

LOCOMOTIVE ENGINE FOR RAILWAYS.

The Brussels paper *L'Emancipation* has the following notice of a new locomotive engine intended by its cheapness for keeping up communications between places at short distances:—

M. Deridder, jun., who was formerly the director of the Belgian railroads, has just completed a locomotive on a new system, which will be considerably more economical than the present ones, both with respect to the consumption of coal and the weight of the rails; the introduction of the new plan of M. Deridder being much less expensive. Short branches of communication may be established between certain places and the high roads, because the proceeds of those undertakings will cover the expenses of such an establishment. Such is the object this engineer proposes. During the course of the month of November, a trial of M. Deridder's locomotive will be made on the south section of the Belgian railroads.

PLAN FOR ARTIFICIAL FLYING.

The following statement is taken from one of the New York papers last received. "We have had a conversation with Mr. Davidson, of Virginia, who has given much attention to the subject of navigating the atmosphere by means of artificial wings, and who has come to this city for the purpose of constructing the machinery by which this object is to be effected. Mr. Davidson sets out with the position that nature, in providing for the passage of birds through the air, has employed the easiest and most effectual method, and accordingly his machinery is in imitation of the method of birds in flying. But as it is impossible that the arms should supply sufficient strength to support the body in the air for any length of time, he proposes to call in the aid of the legs and feet, by which he supposes that the object may be accomplished with little more fatigue than is caused by walking on the earth. Mr. Davidson, who is a member of the bar of Virginia, proposes to give public lectures, explaining his plan, and showing its practicability." The object of his project is the transportation of the mails through the air, at the speed of 100 miles an hour.

MR. PERKINS'S NEW STEAM BOILER.

Mr. Perkins applied to Mr. Parkes, civil engineer, to state his opinion of the applicability of his newly invented steam-boiler to engines—the safety, durability, and economy of the apparatus—and also the utility of the hot-water grate, which it would seem can be separately and economically applied to boilers now in use. Mr. Parkes accordingly instituted a series of experiments on a boiler constructed on Mr. Perkins's principle, which had been nine months in use, with a view of ascertaining its power, economy, and safety, as a generator of steam. The results obtained by these experiments are reduced into a table, showing that under similar conditions of rapidity, as regards combustion and evaporation, both the power and economy of Mr. Perkins's boiler are equal to those of others for equal surfaces exposed to absorb the heat of a given weight of fuel burnt in a given time. The mean of a series of four experiments performed at a rate of combustion which might be called the most common rate of condensing engine practice, exhibited a product of eleven cubic feet of water converted into steam per hour from 117 square feet, equal to one cubic foot from ten square feet of surface exposed to heat, and 100 deg., the initial temperature of the water, was about the average of that of the hot wells of condensing engines, whence the boilers are fed. "This," observes Mr. Parkes in his report, "is a highly interesting and satisfactory result as respects the peculiar structure of your apparatus; for, as no portion of what is commonly called the boiler (which in your arrangement is a mere recipient of water and steam) is exposed to direct heat, and as the entire heat-absorbing surface consists of pipes filled with water under pressure, it becomes evident that the sixteen slender threads of water which compose the generator, absorb and transfer the heat of the fire to the recipient with a velocity equal to that of the passage of the same quantity of heat through the same extent of metallic surface in ordinary boilers. The rapidity of the circulation, or, perhaps it would be better expressed, the velocity of the current of heated water in the pipes, must be very great, as in each of the sixteen sets there is only half a gallon of water; and this slender thread of water, half an inch in diameter, traverses forty-

eight lineal feet in its process of absorbing and imparting caloric. * * * The rapidity of this motion within the pipes of your boiler is practically exemplified by the production of steam in the recipient, for no appreciable time seems to be occupied in the transfer of caloric; a sudden increase or diminution effected in the temperature of the furnace seems to be propagated to the water in the recipient as quickly as if the recipient itself were exposed to the fire. The fire and generation of steam are under the same control by the damper in your boiler as in those of the ordinary construction. In the absorption and transfer of heat by the pipes of the boiler experimented upon, another remarkable phenomenon presented itself, viz., that forty-four square feet of pipe imparted to the water in the recipient the whole of the heat taken up by 117 square feet exposed to the fire; and, as it was ascertained that the heat entered the chimney at a higher temperature than that of the steam, we know the absorbing surface to have been in every part of it hotter than the water in the recipient. This proves water to be a much better conductor of heat than iron, for an equal surface of water has abstracted from the iron pipes 2 6-10th times more heat than the pipes have absorbed from the fire in the same interval of time." Respecting the safety and probable durability of the boiler, these important qualities appear to Mr. Parkes to be secured by the hot-water apparatus in a degree far superior to those possessed by any other description of boiler which ever came under his notice. Deterioration and insecurity occur in steam-boilers from various causes, but, it may be said, principally from siliceous deposits on the parts exposed to heat; from the corrosive action of the fire, or its deposits, on the exterior of the metal; and from deficiency of water. By Mr. Perkins's arrangement, however, the small pipes alone, forming the grate, are attacked by the fire, and the water within them not being evaporated, there can be nothing deposited by the water to impair their substance or their action as carriers of heat. So long, therefore, as these pipes remain full, Mr. Parkes is of opinion that they must be almost indestructible. Supposing, however, the metal in course of time to become impaired, all that could occur would be the bursting of a pipe and the discharge of its water; or, pushing possibilities to the extreme, and supposing the whole of the pipes to burst at the same instant, the only effect produced would be the issue of a few gallons of water in a state of steam, and perfectly harmless. The pipes not attaching any soot or tar to them, the water within being too hot to condense these products, no deterioration from these causes can possibly affect the body of the boiler or recipient, it being altogether insulated from the fire and from the products of combustion. The boiler, therefore, cannot suffer decay of its exterior except from leakage; thus obviating a great source of expense and danger in the boilers in common use. Another cause of deterioration, and frequently of imminent danger, whether produced by neglect or accident—namely, deficiency of water—was proved, by repeated experiments, and the most trying tests, to have no existence in boilers of Mr. Perkins's construction. Mr. Parkes deduces the following important conclusions from his experiments:—

"1st.—That your boiler may be blown off, and entirely emptied, without the slightest danger or inconvenience, when the fire is in full activity, and that in a few minutes an engine may be again at work. In practice it would be always wise to keep the fire-door open during the evacuation and refilling of the boiler.

"2d.—That in the event of an engine-man neglecting to supply the boiler with water, or in the event of any derangement occurring to the feed apparatus, no harm can ensue; for both the quantity of steam produced, and its pressure, rapidly diminish when the water quits the pipes. An engine would stop for want of steam, and announce the fact of your boiler becoming dry, were it otherwise unobserved.

"3d.—That no harm can ensue from suddenly injecting cold water into your boiler when empty, and an intense fire in action, as the heated pipes would discharge their water before it could attain a temperature capable of decomposing steam in the recipient.

"4th.—That a vacuum cannot be produced within the boiler by the sudden injection of cold water by the ordinary feed pumps when the fire is in action; for, as the supply is sent through the pocket, the pipes evaporate fast enough to maintain a constant elasticity of steam above atmospheric pressure.

"5th.—That all the expense and danger consequent to overheated or dry flues, in marine or other common boilers, are avoided by your arrangement; for in your boiler there are no flues nor extensive weak surfaces to be burnt, burst, or collapsed."

SCIENTIFIC CORRESPONDENCE.

INJURIOUS EFFECTS OF THE PATENT LAWS.

To the Editor of the "Inventors' Advocate."

Sir,—Having completed several useful inventions, but not having sufficient capital to bring them before the public by patent, I am most anxious to know, through the medium of your excellent journal, if (provided I exhibit a model) I can be protected by any legal instrument for a limited period? the main object being, of course, to effect a sale of the invention during the period of such protection.

On the Continent (I am informed) patents may be secured for a comparatively small sum, which must materially tend to the advancement of their commerce, &c. If this country were to follow the example, it would be an encouragement to men of genius, science, and research; and by giving an impetus to trade, would create employment for mechanics.

What can induce our government to throw so many difficulties in our path, I am really at a loss to discover; but of this I am certain, a continuance of such an absurd system will entirely crush every attempt at improvement, and give the advantage to our neighbors.

I am, Sir,
Your obedient Servant,
Frederick Webster.

[The law affords an inventor no protection against piracy, nor gives him any redress, if he shows the invention before the patent is granted. He must trust to the honor of the parties alone.]

DISPUTED PATENT RIGHT.

(*To the Editor of the "Inventors' Advocate."*)

Sir,—I have received the following circular from your office:

"*Copy of an Advertisement which appeared in the Morning Herald of the 31st October, 1840:—*

"TO CAPITALISTS AND LOCK MANUFACTURERS.

"The Patentee of Mr. W. M. Williams's Improved Lock, having seen an advertisement in the Morning Herald, of the 29th October instant, with reference to A. B., Patent Office, 198, Strand, begs to inform the Public that there is not any Lock patented, either before or since Mr. Williams' Patent, upon the same, or even a similar principle, (as may be seen by reference to the specifications duly enrolled). The principle of A. B.'s Lock was well known to Mr. Williams before his Patent was obtained."

In reply to Mr. Williams's statement, I need only give an extract of both specifications; any mechanic will find that the improved locks work on the same principle.

Mr. Williams states in the specification of his patent, dated February 27, 1840:—

"In order, therefore, to unlock, that is, to throw back the bolt, all the sliders must be first pushed into such situations as will bring their notches into exact coincidence with the groove in the rack-box, and the bolt will be immediately thrown back by the power of the feather spring. The bolt may be moved to and fro by an external button or thumb piece, without employing the main spring and driver, or the feather spring."

This principle is given in the following words, taken from the specification of my own patent, dated July 3, 1839:—

"Each of the flat rings, discs, or sliding wards, has one deep notch, and these notches must be placed coincident before the bolt of the lock can be thrown back."

Mr. Williams uses the term "sliders" where I use "sliding wards."

Trusting, Mr. Editor, you will allow Mr. Williams to give his reply to this letter, I shall reserve all further comment, and remain,

Your obedient Servant,
Bryanston Street. Alexander Cochrane.

CENTRAL HEAT NOT THE CAUSE OF GEOLOGICAL CHANGES.

(*To the Editor of the "Inventors' Advocate."*)

Sir,—It is a fact in meteorology, that the climates of the earth depend upon the line of direction of the solar rays, the intensity of which is greatest at the equator, and least at the poles; or to speak in concise terms,—greater the obliquity of the sun's rays, less their intensity; and *vice versa*.

Were the apparent path of the sun directly along the equator, and the entire surface of the earth homogeneous and perfectly level, the climates of the earth would be in geometrical ratio, from the equator to the poles. But as the path of the sun forms an angle of 23 degrees with the equator, or, in other words, as the lines of rotary and revolving motion have an obliquity of 23 degrees, there is obviously a reaction from these two motions, upon which evidently depends the resulting variation from the general principle above stated: and when we take into consideration the varied localities on the earth's surface, we find ample explanation of *local* climatic diversity.

From this it follows, that any *general* alteration in the climates of the earth must depend entirely upon a change in the angle of obliquity before mentioned, and that local diversity is only the result of varied locality.

Admitting that the earth possesses a central heat, acquired when in a different state, or when its density was less than it now is, I cannot for a moment allow that the dissipation of that heat would *generally*, and I question whether it would ever appreciably, affect the climates of the earth *locally*.

It is a fact both in chemistry and mechanics, that a maximum of motion gives a maximum of heat and a minimum of density, and *vice versa*.

Now, applying this principle to our earth, we find that the maximum of motion is at the equator, and the minimum at the poles.

In the case of a body possessing inherent heat, it is entirely owing to the compression of the mass that the heat thereof is given out.

According to the above law, the minimum of the earth's density is at the equator, and the maximum thereof at the poles; consequently the points of compression are at the poles, and the imparting medium at the equator; hence, while there is a force to expel the external heat, there is, by virtue of the earth's rotation, an imparting medium to conduct it externally. In short, in exact proportion to the force of compression at the poles, is the conducting power at the equator.

From the foregoing it is evident, that where a maximum of compression exists, there the least dispersion of heat takes place, and *vice versa*. And, that as the compression of the poles and dilatation of the equator are the results of one cause, the heat expelled will never receive any resistance in its egress;—such is the compensating economy of nature.

Again, all powers acting from a centre radiate, and consequently the action of central heat must be in accordance with the laws of radiation, viz.—that the force is imparted in radial lines, and that it decreases as those lines increase.

The dissipation of the heat entirely depends upon its temperature; that is, unless its temperature ex-

ceed that of the accumulated solar heat at the earth's surface, no dissipation thereof can take place; for temperatures *comparatively* obey the same law that governs atoms—lower temperature being analogous to denser bodies, and higher temperature to bodies less dense,—it is, therefore, self-evident that temperatures preserve among themselves a gravitating equilibrium.

It has been shown, or attempted to be, that the maximum force of radiated heat must be at the equator, and that the power of radiation decreases as the latitudes increase; if this be the fact, how a decreased radiating power could transfer the coral of southern climes, overcoming the maximum of radiation at the equator, to northern regions,—to the hills of England,—appears marvellous. But this is not the only wonder;—how a power, whose principle was that of radiation, or of acting *vertically* throughout, should reflect *itself* into a *lateral* force, is strange indeed!

It is only by imagining the laws which govern internal action to be the reverse of those of external force, and that while in the latter heavy bodies sink and lighter ones rise, and a maximum of force is superior to a minimum,—in the former the opposite obtain,—that I can reconcile the contradictions taught by the speculators of the theory of central heat.

"There is no appreciable motion of the poles, relative to the plane of the present equator." * The insinuation contained in this quotation, is but an apology for an argument; for we well know that motion of the nature alluded to, whether appreciable or not, accumulates, and that which during a short period is imperceptible, in the course of ages becomes apparent.

Geology informs us, that all the *general* causes which have produced the changes in our globe, have been slow in their operation and gradual in their development—so much so, that they would for ever have been hidden, had not their effects revealed their accumulated influence.

With respect to the opinion of an authority I quoted in my last letter, I would beg to state, that I should not infer from his work that he entertains the theory of a transition of the poles; he merely states that a transition would produce the grand changes revealed by geology—at least so I understand him—and it was only for the elucidation of this point I made the quotation.

Mr. Delabeche is by no means positive on the theory of central heat. In the preface to his work, entitled "Theory of the Earth," he remarks, that he has adopted the theory of central heat because it appears to him the most satisfactory: so soon, he observes, as a better one be substituted for it, he is willing to embrace such.

As regards my remarks, that the theory of the transition of the poles is rapidly gaining ground, it was inferred negatively. I will on the present occasion modify my meaning by saying, that the theory of central heat, relatively to its assumed effects, is rapidly losing ground, since, I have heard on good authority, that Sir John Herschel has seen reasons to discountenance it.

To those who would establish the philosophy of to-morrow upon the hypotheses of yesterday, I would say, be patient, and to use a common phrase, remember that Rome was not built in a day.

I am, Sir,

Yours respectfully,

Stepney,
November 9, 1840. J. M. CAVALIER.

[The discussions which have for some time past been carried on in our Journal, between Mr. Cavalier and Mr. Utting, respecting the theories of the earth, were inserted with the view of giving publicity to their ingenious speculations on that interesting subject. The controversy has now almost become exhausted of its general interest, and several of our readers cry "hold—enough!" We must therefore decline to continue the discussion any further. We have hitherto abstained from all comment on the controversy, which has been so ably conducted; but now that the subject may be considered as concluded, we shall in an early number review the principal arguments on each side, so far as they relate to the geological theories of the earth, and state our own views on the subject.]

* This statement is not in the exact language of those who advocate the theory of the transition of the poles,—were it, it would read thus:—There is no appreciable motion of the poles relative to the ecliptic.

ORIGINAL REPORTS OF SCIENTIFIC MEETINGS.

(*Contributed expressly to the Inventors' Advocate.*)

MEETINGS OF THE SCIENTIFIC BODIES OF LONDON,—FOR THE WEEK COMMENCING NOVEMBER 15, 1840.

Monday.	Statistical Society	8	P.M.
	Medical Society	8	P.M.
Tuesday.	Linnæan Society	8	P.M.
	Architectural Society	8	P.M.
Wednesday.	Society of Arts	7½	P.M.
	Geological Society	8½	P.M.
Thursday.	Royal Society	8½	P.M.
	Society of Antiquaries	8	P.M.
Friday.	Botanical Society	8	P.M.
Saturday.	Asiatic Society	2	P.M.
	Westminster Medical Society	8	P.M.
	Mathematical Society	8	P.M.

SOCIETY OF ARTS.

Nov. 11. *Mr. Moore, V. P., in the Chair.—Illustration Meeting.*

This being the first illustration or lecture meeting of the session; according to notice Mr. Deville delivered a lecture on Bronzes. The object the lecturer had in view on the present occasion was to furnish a short history of the art of bronzing, and more especially to point out the character and peculiarity of a few of the more celebrated artists, from the earliest periods to within a few years. The works of art exhibited as illustrations were of the most choice and unique character. The lecturer divided his subject into three different portions.—1. The knowledge of the art as known prior to the Christian era, or epoch.—2. From the commencement of the period just alluded to up to the 14th century.—3. An account of the most celebrated artists who lived in the 15th and 16th centuries.

Of the first. To prove that the art of bronzing was long known prior to the Christian era, Mr. D. adduced specimens, in a fine state of preservation, from the coffin of a mummy, together with two bronzed heads covered with real hair in good state of preservation, one merely covered with some linen cloth, and the other with bitumen, in both instances by way of a preservative; they were stated to be at least from 3500 to 4000 years old. In all the specimens referred to, obtained from such sources, the lecturer could not detect the slightest trace of the markings usually left by the mould, nor could he discern that any tool or file had been used in any part of the figures, which led him to infer that they, together with other artists of more recent origin, were in possession of a mode of casting altogether unknown at the present day.

The color of the bronzes varies considerably—in a great measure depending on the materials employed in making the metal,—and here Mr. Deville stated that he wished to correct an erroneous opinion very prevalent, namely, that the metal of which bronzes are formed is not *peculiar*, as generally imagined, but composed of two or more metals melted together, depending on the fancy or experience of the artist; copper and tin in the proportions of nine parts by weight of the former to one of the latter, is very generally used in this country. In France a mixture of copper with German zinc is in much demand.

The color peculiar to bronze is produced by coloring matter mixed with an acid which forms the basis. Among the oldest of the specimens exhibited he alluded to specimens obtained from Egyptian relicts, and upwards of 4000 years old; from these specimens it appeared that the Egyptians must have been acquainted with the peculiar conformation of the head and types of the nations very far distant from them, as was evident from decided representations of the African, Malay, &c., in which the difference of contour in the head was strikingly manifest. As a proof that the ancients were acquainted with the method of making vessels of sheet material by means of the hammer, a singular and beautiful formed vase was shown obtained from Herculaneum. It appeared from the evidence adduced by Mr. Deville, that the finest works of art, of this character, were performed by the ancients, and that since the 16th century little or nothing had been accomplished which could be compared with those of former times, with the exception of a few interesting designs by Chantrey, Westmacott, and one or two others. He attributes the decline of this art to Louis XIV., who was so great a gourmand (to use the lecturer's own words) for marbles and bronzes that he collected a number of artists together at Versailles to accomplish his end, and in this way a variety of means were resorted to, to finish up the works after they had been cast; thus introducing a variety of workmen, (chasers, finishers, &c.,) where formerly but the caster was employed; the effect of which is that at the present time the castings are forwarded to chasers and modellers.

Mr. Deville (well known in the trade and as a connoisseur in bronzes) stated that he had paid attention to the subject ever since the year 1791; that in 1796 he first sold them, since which time he has disposed of upwards of £40,000 worth. Some years since he offered his collection, which cost £70,000, to the government for £15,000; the offer was refused.

He concluded his remarks with a notice of some of the leading artists of old and modern times, and adduced some curious instances of the different artists modelling after their own mode of life, such as those fond of *persecuting*, pourtraying in their works that particular feature, and those of dissolute habits adhering to theirs, &c.

A more interesting and novel subject could scarcely have been chosen for an Illustration meeting. It was to all intents and purposes a meeting well illustrated, as the specimens were of the finest description and selected from Mr. Deville's very extensive collection. We can but admire the assistance he is desirous of showing to young artists, &c. by inviting them to his residence to view the various works of art, when he promises to point out the peculiarities of the several masters more in detail; and it is to be hoped that such meetings will be the means of placing this very useful and practical society on the same footing it formerly enjoyed. The attendance was numerous, including ladies—thus calling to our mind the Friday evening meetings of the Royal Institution.

Mr. Varley and Mr. Ross jun. attended with the recent microscopic novelties in the model room.

METEOROLOGICAL SOCIETY.

Tuesday, Nov. 10. *Lieut. Morrison, R.N., in the Chair.*

After the minutes of the last meeting had been read and confirmed, W. H. B. Webster, Esq. of Ipswich was elected a member. Several donations of books were announced from Berlin, Brussels, Cheltenham, Sheffield, &c.

Weather journals, which had accumulated since June last, from Aylesbury, Carlisle, Cleckheaton, Canterbury, Dundee, Gosport, Hereford, London, Sheffield, Thetford, Wycombe, from two observers, and Yarm, were compaed, from which many remarkable coincidences with barometric curves were observed, especially during any great changes in atmospheric pressure. The Gosport journals contained daily accounts of the weather, with minute details of various atmospheric phenomena, such as meteors, aurorœ boreales, halos, parheliæ, zodaical light, gales, hurricanes, waterspouts, &c.

The Thetford journals were also highly interesting and exceedingly valuable, as they contained minute accounts of the prevailing diseases for each month in connection with the state of the atmosphere. Many other journals contained important facts, tending to illustrate the laws of the meteoric action.

The reading of many notices on gales, hurricanes, &c., was postponed till the next meeting.

The meeting then adjourned till Tuesday, December 8th.

FIRES CAUSED BY SPONTANEOUS COMBUSTION.

M. A. Booth, lecturer on chemistry, has sent a letter to the Lord Mayor, in which he enumerates several instances of fires caused by spontaneous combustion; and mentions the case of a young man, who was executed for alleged incendiarism, when the fire was afterwards found to have originated spontaneously. Mr. Booth says:—

"My attention was more particularly called to the subject of spontaneous combustion in 1829, from the circumstance of the execution of a young man named James Butler, who was convicted on a charge of setting fire to a floor-cloth manufactory. After his execution I became acquainted with the details, and, after most closely and carefully investigating the subject, came to the conclusion that he was an innocent victim of the law, in which view I was supported by my friend the late Dr. Gordon Smith, then professor of medical jurisprudence at London University College, Dr. Birkbeck, and several other scientific men.

"The cases under which spontaneous combustion of animal and vegetable substances will take place are such as no ordinary sagacity can foresee nor prudence prevent. In the official reported list of fires the majority of causes are unknown, whilst another large portion are only conjectural. The science of chemistry may, however, advantageously lend its aid, and some of its investigations on the subject have been matters of high interest. The most memorable instance on record is that of a series of fires which took place at St. Petersburg in 1780 and 1781, when a frigate with several other vessels and houses were destroyed, supposed to have been the work of an incendiary. A scientific commission was appointed by the Russian government to inquire into the subject, who found that the self-enkindling substances were charcoal, hemp, and oil. In 1757 the Royal Dockyard at Brest was nearly destroyed by spontaneous combustion taking place in the rope-yard, when some of the old workmen declared that the same thing had happened some years ago, but that, conceiving it impossible for the bales to take fire of themselves, they had concealed the accident, for fear of being taxed with negligence, and punished accordingly. On Thursday, July 3d, 1760, a fire from spontaneous combustion broke out in the rope-yard of the Royal Dockyard at Portsmouth, which caused much mischief. It would be tedious to relate the other various circumstances under which spontaneous combustion will take place, such as with hay, corn, flax, cotton, wool, turf, flour, saffron, and other vegetable substances; rags, oatmeal, charcoal; woollen cloth and cotton goods; roasted coffee, and chocolate; bales of woollen yarn or cloth, waste cotton or rags used in cleaning oil, paint, floor-cloth, pyrites, coal, &c., although the subject is one of considerable importance in our domestic security."

CORNISH STEAM ENGINES.

Several experiments have been made in Cornwall upon the Cornish steam engines employed in the mines, for the purpose of satisfying the inquiries of the deputation from the Government of Holland as to their efficacy and capability of being advantageously employed in the projected plan for draining the lake of Haarlem. A letter has been addressed to the editor of the *Mining Journal*, by Mr. Thomas Wicksteed, the civil engineer, on the duty performed by Cornish steam-engines. Mr. Wicksteed, who is the engineer of the East London Waterworks, at Old Ford, near Bow, was the first person who introduced a Cornish engine into London, and from his experience of their powers and their relative merits, as compared with other engines, is qualified to give an opinion upon them. The letter contains a table, setting forth the diameter of the cylinder, and performances of duty of eight engines — viz., Bowey Consols—Austin's; Wheal Vor — Borlase's; Wheal Darlington; Charlestown United Mines, ditto Stamping-engine; Wheal Ver stamping engine; the Cornish engine at the East London Waterworks, designed and erected by Mr. W. West, and a Bolton and Watt engine, on the same works, boiler and cylinder, &c., clothed with Boradaile and Whiting's patent felt, and pumps fitted with Harvey and West's patent valves, the duty reported as performed during a six hours' trial, the average duty performed during twelve months' trial, the average of coals used per hour per horse power, and other particulars of the variation in the duty performed, &c. Mr. Wicksteed says, "An inspection will show how little reliance is to be placed on short trials, for in the same engine the variation in duty during twelve months' regular work is very great, and taking the Wheal Vor stamping-engine, the duty done during the short trial was less than the average reported duty for twelve months." Mr. Wicksteed, who deprecates all inferences from short experiments, has set forth the result of twelve months' duty. The table he has drawn up establishes the fact contended for, viz., the great superiority of the Cornish engines, the saving of fuel by their employment, and the admirable manner in which they perform their duty. In the Cornish engine which has been in use at the East London Waterworks at Old Ford, the company have experienced a saving of about £2,400 a year in coals. Like all other attempted improvements, the introduction of Cornish engines into London, and the application of them to the purposes of raising water for the supply of the metropolis, met with discouragement, if not with opposition. The invention of these engines is not a novelty; but their adaptation to the purposes for which the one at Old Ford is applied, is due to Mr. Wicksteed. The following extract from a printed paper by that gentleman, on the "Effective Power of the Cornish Steam-engine," will give a further explanation of this subject:—

"The principle of expansion is not new; it is the extent to which it has been carried, especially of late years, by the successful adoption of steam at a higher temperature than is used in the common condensing engine, which is new.

"The late Mr. Watt took out a patent in 1782 for working steam expansively, and in his specification, dated March 12, 1788, he says, 'My new improvement in steam or fire engines consists in admitting steam into the cylinder of the engine only during some certain part or portion of the descent or ascent of the piston, and using the elastic forces wherewith the said steam expands itself in proceeding to occupy larger spaces as the acting powers on the piston, through the other parts or portions of the length of the stroke of the piston.'

"He then shows, that if steam of 14 lb. pressure is admitted into a cylinder, and cut off at one-fourth of the length of the stroke, at half the stroke the pressure was reduced to 7 lb.; at three-fourths of the stroke to 4¾ lb.; and at the end of the stroke the steam would be reduced to 3½ lb., or one-fourth of its original power. He then shows that the sum of all these powers is greater than 57-hundredth parts of the original power multiplied by the length of the stroke, and, consequently, that one-fourth the steam thus used produces more than half the effect that four times the quantity would have produced if worked dense through the whole stroke.

"He then says, 'consequently, the said new or expansive engine is capable of easily raising columns of water, whose weights are equal to 5 lb. on every square inch of the area of its piston, by the expenditure of only one fourth the contents of the cylinder of steam at each stroke.'

"He had previously shown that the engine working dense steam might be loaded to 10 lb. per square inch of the area of the piston.

"And lastly, he says, 'and though, for example, I have mentioned the admission of one-fourth to the cylinders full of steam, as being the most convenient, yet any other proportion of the content of the cylinder will produce similar effects, and in practice I actually do vary the proportions as the case requires.'

"The casing of the cylinders, boilers, and steam-pipes is not new either; but I have never seen it carried to the same extent as it is at present in Cornwall.

"Great and deserving credit is due to the perseverance, energy, and ingenuity of the Cornish engineers for bringing the expansive engine to the state that it now is, and for daily improvements, which, although taken separately may appear trivial, are, in the aggregate, of great importance."

THE ORIGINAL INVENTORS OF THE STEAM ENGINE.

The following interesting account of the Marquis of Worcester, the author of the "Centurie of Invention," and supposed to be the original suggester of the application of steam-power, is given in a letter by Marion Delorme to the unfortunate favorite of Louis XIII. It appears in Miss Costello's "Summer among the Bocages and the Vines." It seems from this letter that the Marquis of Worcester was not the first who conceived the idea of rendering the power of steam available; and that he derived the notion from a Frenchman, whom cruel treatment had driven mad.

"Paris, Feb., 1641.—My dear Effiat, while you are forgetting me at Narbonne and giving yourself up to the pleasures of the court and the delight of thwarting M. le Cardinal de Richelieu, I, according to your express desire, am doing the honors of Paris to your English lord, the Marquis of Worcester, and I carry him about, or rather he carries me, from curiosity to curiosity, choosing always the most grave and serious, speaking very little, listening with extreme attention, and fixing on those whom he interrogates two large blue eyes, which seem to pierce to the very centre of their thoughts. He is remarkable for never being satisfied with any explanations which are given him, and he never sees things in the light in which they are shown him; you may judge of this by a visit we made together to Bicetre, where he imagined he had discovered a genius in a madman. If this madman had not been actually raving, I verily believe your marquis would have entreated his liberty, and have carried him off to London, in order to hear his extravagances, from morning till night, at his ease. We were crossing the court of the madhouse, and I, more dead than alive with fright, kept close to my companion's side, when a frightful face appeared behind some immense bars and a hoarse voice exclaimed, 'I am not mad! I am not mad! I have made a discovery which would enrich the country that adopted it.' 'What has he discovered?' I asked of our guide. 'Oh!' he answered, shrugging his shoulders, 'something trifling enough; you would never guess it; *it is the use of the steam of boiling water.*' I began to laugh. 'This man,' continued the keeper, 'is named Salomon de Caus: he came from Normandy, four years ago, to present to the King a statement of the wonderful effects that might be produced from his invention. To listen to him you would imagine that with steam you could navigate ships, move carriages, in fact, *there is no end to the miracles, which, he insists upon it, could be performed.* The cardinal sent the madman away without listening to him. Salomon de Caus, far from being discouraged, followed the cardinal wherever he went, with the most determined perseverance, who, tired of finding him for ever in his path, and annoyed to death with his folly, ordered him to be shut up in Bicetre, where he has now been for three years and a half, and where, as you hear, he calls out to every visitor that he is not mad, but that he has made a valuable discovery. He has even written a book on the subject, which I have here.' Lord Worcester, who had listened to this account with much interest, after reflecting a time, asked for the book, of which, after having read several pages, he said, '*This man is not mad.* In my country, instead of shutting him up, he would have been rewarded. Take me to him, for I should like to ask him some questions.' He was accordingly conducted to his cell, but after a time he came back sad and thoughtful. 'He is indeed mad now,' said he; 'misfortune and captivity have alienated his reason, *but it is you who have to answer for his madness; when you cast him into that cell, you confined the greatest genius of the age.*' After this we went away, and since that time he has done nothing but talk of Salomon de Caus. Adieu my dear friend and faithful Henry. Make haste and come back, and pray do not be so happy where you are as not to keep a little love for me,—Marion Delorme."

SCIENTIFIC MEMORANDA, AND NOTES ON ART.

The Bishop of Durham has accepted the office of patron of the Sunderland Literary and Philosophical Society, vacant by the death of the Earl of Durham.

Spirit from the Bilberry.—In the province of Luxembourg, in Belgium, wine, brandy, and vinegar have been made exclusively from the fruit of the bilberry (*Vaccinium Myrtillus*), a shrub not hitherto turned to any use. This discovery promises to prove of good account, in these northern regions in which the bilberry grows abundantly. In the northern parts of this country vast tracts are covered with this common shrub.

Erratic Block of Granite.—An immense erratic block of granite was floated on the ice during the winter, 1837-38, from Finland to the island of Hochland. It weighed about a million pounds, according to the estimate of M. de Baër. —*W. Weissenborn.*

Protective Inks.—The committee of the Society of Arts for Scotland report, that after many experiments they have found Dr. Traill's ink to be perfectly indelible and indestructible, if written on proper paper; and that the proper paper is that which is unsized and porous, like common printing paper. It appears that some banks have adopted this ink for orders, letters of credit, &c. The committee have also reported that Dr. Veitch's ink, though indelible, destroys the paper.—*Jameson's Journal.*

Isinglass from Indian Fish.—Dr. Cauter has examined the Suleah fish (the *Polynemus Sele* of Hamilton), and has found an individual of 2 lbs. weight to yield 65 grains of pure isinglass, an article which sells in India at 16 rupees (£1 12s.) per lb. The air-vessels form the isinglass, requiring only the removal of the vascular membrane that covers them, washing with lime-water, and drying in the sun. As these fishes attain a great size, they promise to furnish an abundant supply of isinglass in India.—*Proc. Zool. Soc.*

Vinegar Adulterated by Muriatic Acid.—In order to detect this fraud the vinegar must be distilled, and then the addition of a small quantity of nitrate of silver occasions a white precipitate of chloride of silver. When the vinegar is pure, it does not form a precipitate with the nitrate of silver. Vinegar is seldom adulterated with nitric acid, which is indeed generally expensive. If this were the case, it could easily be detected by saturating the liquid with potass, and by afterwards evaporating it till it becomes dry. The deflagration of the residue thrown upon burning coals, will leave no doubt with regard to the production of nitrate of potass (saltpetre), and consequently no doubt of the pre-existence of nitric acid in the vinegar.

On Sponges.—The animal nature of the sponge is not distinctly made out. Those found in collections are merely the skeletons of the living mass, entirely destitute of the gelatinous portion which constitutes the animal, if it be really of that nature. Some naturalists have considered these skeletons or sponges as analogous to the stems of *Antipathes*, or black coral, and consequently to the axes of zoophytes; and have fancied that, when alive, they were covered, like the *Antipathes*, with a perishable crust, consisting of the dried polypes. But recent observations on them in their living state have not verified this theory; for they have been found to be entirely destitute of any polypi, to be mere living masses covered with a gelatinous coat, and absorbing water through the small pores spread over their surface, and emitting it by the larger scattered holes called *oscula;* and though the fibres of many of the sponges greatly resemble the axes of the *Gorgoniæ*, in their chemical composition and organic structure, they, nevertheless, cannot be confidently pronounced to belong to the animal rather than to the vegetable kingdom. In some the skeleton, which alone can be shown in the dry state, consists of a horny fibre *(Spongia)*, in others it is formed of interwoven calcareous spicula, which greatly vary in their shape. In a few the spiculæ are formed of pure flint, and of sufficient hardness to scratch glass.—*J. E. Gray in Synopsis. Brit. Mus.*, 1840.

Mines in Great Britain.—If we estimate the value of the metals annually raised in Great Britain and Ireland at about £10,597,000, and consider that of this sum the iron amounts to £8,000,000, the value of the remaining metals would be £2,597,000, of which Cornwall and Devon would furnish about £1,340,000, or more than one-half, leaving £1,257,000 for the value of all the metals, with the exception of iron, raised in other parts of the United Kingdom. The two great metallic products of the district are copper and tin; of the former it yields one-third, and of the latter nine-tenths of the whole supply of copper and tin furnished by the British Islands, and all the countries of the continent of Europe.—*Report of the Geological Society.*

Compressed Peat Fuel.—The *Perth Courier*, referring to the advantages to be derived from the use of compressed peat as fuel in the manufacture of steel, observes:—"We have repeatedly referred to a machine, some time ago invented by Lord Willoughby d'Eresby, and latterly perfected by skilful artisans under his direction, for compressing peats. One of his Lordship's tenants, on the Drummond Castle estate, Mr. Clark, at Coryour, has of late been manufacturing the new fuel, chiefly for the jewellers and steel forgers in England; and this week a very large supply arrived at the new quay for shipment to London. It is made up in the shape and size of soap-bars, and so powerful is the compression employed that the original peat is hardly to be recognized in the black and metallic-looking mass which the machine perfects. The properties of this new fuel are found to be highly advantageous in the branches of manufacture above referred to, and its great economy is evidenced in the reduced price at which cutlery wrought with it is offered for sale. Sheffield razors, bearing the mark of "Peat compressed," have been on sale this year throughout the country, we have been informed, as low as 27s. per dozen. Considering the great extent of mosses in the Highland districts particularly, we look for a rapid extension of the use of this valuable invention of Lord Willoughby's, not only as offering the means of procuring for the inhabitants an abundant supply of a more cleanly and useful fuel than they have hitherto, from their inland situation, been able to obtain, but opening up to them a profitable branch of industry, for which the field is nearly as inexhaustible as that of the material."

Gypsum as Manure.—The following "notes of an experiment with gypsum," are given by Mr. Matthew Milburn, who tried the effects of it on a small clover farm:—"My farm, on which the experiment was made, has long been under clover. It is and has been for the last twenty years carried on upon the four-course system. It is now impossible for a full crop of red clover to be grown upon it. In order to remedy this, gypsum had been recommended by Davy, &c., which I determined to try. Last year I had a piece under red clover. It is the best piece of land in my little farm, and had been limed for the crop of turnips the two years previously. The plant was generally well set after the barley was reaped. The soil is light loam—subsoil, a porous gravel, and perfectly dry. I staked a piece out in March, 1839, and applied grossly powdered gypsum at the rate as near as I could guess of about three bushels per acre. I watched the plot narrowly through summer, but it partially failed like the rest, nor could I see any greater vigor in the plants which remained, nor could I perceive the slightest difference in the second crop upon the gypsum piece, nor any difference in the subsequent crop of wheats. I ought to have stated that the gypsum was not calcined. On a previous occasion a friend presented me with a cask of chemically prepared gypsum (sulphate of lime). I laid it on in May, on a wet morning, at the rate of about three bushels per acre, soil sandy—subsoil, white sand, with an occasional stratum of gravel. I could not perceive the slightest improvement in the crop over that where no gypsum had been applied."

Soot as Manure.—Sir Humphry Davy characterises soot as "a powerful manure, possessing ammoniacal salt, empyreumatic oil, and charcoal, which is capable of being rendered soluble by the action of oxygen, or pure vital air; all which component parts rank high as nutritious or stimulant manures." On meadows (says an agriculturist) I have used soot with great advantage in substance, and though sown by the hand, one dressing gave me always heavy crops of hay for two successive seasons; but this is a wasteful mode of applying it, a great proportion of its ammonia, one of its most active ingredients, being volatilised and dissipated in the atmosphere. When mixed with water there is no waste; it is all available; and, for horticultural purposes, I have mostly used it in that state, mixing it up in the proportion of about six quarts of soot to a hogshead of water. Asparagus, peas, and a variety of other vegetables, I have manured with it, with as much effect as if I had used solid dung; but to plants in pots, particularly pines, I have found it admirably well adapted; when watered with it, they assume a deep healthy green, and grow strong and luxuriant. I generally use it and clean water alternately, and always over head in summer; but except for the purpose of cleansing, it might be used constantly with advantage.

The New Comet.—The following are the elements of the new comet, discovered in the constellation Draco:—

	Mean time at Berlin.		
Perihelion passage, Novemher - - -			19.023
	Deg.	Min.	Sec.
Place of Perihelion - - -	34	16	54
Place of the Node - - -	247	0	20
Inlination - - - - -	53	58	58
Log. of Per., distance - -			0.11230

Direct.

The daily motion in right ascension is about 1¼ degree; but in declination it is only a few seconds.

It is a curious fact that a thirty-two-pounder ball, of nearly six inches in diameter, when fired through the timbers of a ship, scarcely makes a hole larger than might be momentarily repaired by the carpenter with a piece of wood of the thickness of a middle-sized walking stick. This is accounted for by the velocity of the ball passing through causing the wood to collapse to nearly its original state.

A telescopic comet was discovered on the evening of October 26, by Dr. Brenicker, at Berlin, who first saw it near the star 17 Draconis. He observed it again on the following evening, but not sufficiently long enough to be able to deduce the direction of its motion.

Archimedian Screw.—Great interest has been excited in the north by this principle being about to be tested by the Great Western Steam Ship Company. The annexed paragraph is from the *Glasgow Courier*:—"We have much pleasure in affording any evidence of the value of this new method of steam propulsion, and we therefore quote the following from a correspondent who is intimately acquainted with its merits:—'Our readers may remember our having noticed some time ago a very large iron steamer building at Bristol for the Great Western Steam Ship Company, and we now learn that this enterprising company have determined to put Smith's steam-propeller in this magnificent and immense floating palace, which will register nearly 3,000 tons, and be propelled with engines of 1,000-horse power. This is by far the largest steam-ship ever yet attempted, and being entirely of iron, and having the screw instead of the paddle-boxes, will completely test the comparative utility of both.'"

VARIETIES.

Metropolitan Water.—In addition to water containing saline and natural impurities, the *well water* of London is sometimes contaminated by organic matters, the source of which, especially in the pump-water of churchyards, is sufficiently obvious; and such is usually the place selected for the parish pump. This disgusting source of water should be avoided; and the disgraceful system of burying the dead in the streets of the metropolis should be authoritatively discontinued. Of this nuisance, abundant instances occur to every one who walks about London; the churchyard of St. Clement's, in the Strand, was, within a few months since, a fair specimen; there are many infinitely worse. In these, the same graves are repeatedly opened, and the coffins thrust in one upon the other, according to a most inexplicable system; and it is beneath this superstratum that the waters of the adjacent wells flow, in some instances, perhaps, deep enough to avoid direct contamination, but never free from the suspicion of the oozings of the vicinity.—*Brande's Pharmacy.*

The *Cuamara, or Tonkin bean tree*, is not only valuable for its seeds, but it is likewise a useful timber tree. Its wood is very hard, and it has been ascertained that a timber one inch square, and of a given length, bears 100 pounds more weight than any other timber in Guiana of the same dimensions; it is, therefore, fit for any thing where great pressure is the object.—*Schomburgh on the Productions of British Guiana*, 1840.

Curious Housebreaking Instrument.—A gang of housebreakers were apprehended last week, in Liverpool; and among the numerous implements in their possession was found an ingeniously-constructed machine for forcing doors. This instrument, which works by a strong screw, will noiselessly exert a force of several tons, and open the strongest doors. It was examined by Mr. Chubb, of that town, a son and agent to the patentee to the detector locks. He states that it is similar to a machine formerly taken from a celebrated and successful housebreaker in London. The machine was submitted to the inspection of Mr. Chubb, sen. and he took measures in the safes which he afterwards constructed to guard against its effects. The instrument is of no great size or weight, but it is beautifully fabricated and strongly put together.

New Mode of Promoting the Growth of Trees.—The Duke of Portland has commenced a new system of strengthening and promoting the growth of trees in his Grace's grounds about Welbeck, by putting pigs in the plantations, and confining them within a given space for a certain length of time to rut the ground at the foot of the trees, and of course to manure the soil. They are then removed to another part of the plantation, and confined in the same way, and are fed upon potatoes.

Cotton Goods Printed in the United States per Annum.

States.	Factories.	Yds. pr an.	Av. value.	Tot. value.
New Hampshire,	2	5,546,667	13 cts.	721,066
Massachusetts,	10	38,162,667	,,	4,831,146
Rhode Island,	9	26,624,000	,,	3,461,220
Connecticut,	(none)			
New York,	7	12,202,667	9 cts.	1,098,240
New Jersey,	2	6,101,334	,,	549,120
Pennsylvania,	4	8,874,667	,,	798,720
Maryland,	2	2,600,000	8 cts.	208,000
	36	100,112,002	dolls.	11,667,512

There are no print-works in any of the other states.

The Coventry Canal proprietors have just finished a new basin at Tamworth, which was projected for the purpose of carrying Mr. Stephenson's coal from the Birmingham and Derby Railway to Northamptonshire, Oxfordshire, Buckinghamshire, and London. The tonnage is one farthing per mile.—*Leamington Chronicle.*

Proposed Joint Stock Company.—A Ship and Steam-Packet Building Company is about to be formed at this port. Some influential shipowners and merchants have started the project, the object of which will be to afford tradesmen and others an opportunity of beneficially employing their surplus capital in a trade which, in Sunderland, Glasgow, Stockton, Yarmouth, and other ports, has been attended with unbounded success.—*Hull Advertiser.*

Cultivation of East India Cotton.—Cotton is produced of good quality over vast tracts of Indian territory, by the application of European skill and energy, as far south as Tinnivelly; and in Vizagapatam, eight degrees farther north, in large quantities per acre, chiefly through the introduction of American modes of culture. This was one of the sites of the former cotton farms, and a part of its effects, as well as of the example of Europeans, is evident in the liberal pruning which is there practised. The fine cottons produced by the unaided efforts of the natives are in the more northern provinces both of the Bombay and Bengal presidencies. Taking into consideration the facts we have before us respecting the native culture of cotton, and the results of the numerous experiments which have been made to improve it, there is sufficient satisfactory evidence to justify confidence in the complete and profitable success of the cultivation of very superior kinds of cotton in various parts of India. But the American or European planters who thoroughly understand the practice must also pay sufficient attention to the principles, so as to be able to modify the former to suit it to the soil and situation in which they are placed. They must also make it their principal business to establish the culture, and to succeed as cotton planters. But attention is necessary to soil and climate, and every part of the improved culture of the present day, as well as to careful picking, early drying, and complete cleaning, by effective machinery, before cotton is packed and can be presented to the merchant for transmission to the manufacturer.—*Dr. Royle on the productive Resources of India.*

The Mammoth Iron Steamer at Bristol.—A gentleman who has recently seen the immense iron steamer building by the *Great Western* Steam ship Company at Bristol, informs us that she will *register* about 3,000 tons, but that her actual tonnage will exceed 3,600 tons, or about 600 tons more than any ship ever built. An immense saving in stowage will be gained in consequence of the adoption of iron for her hull, whilst her draught of water will be comparatively small, owing to the great buoyancy possessed by iron vessels. She will consequently be able to carry coals sufficient both for her outward and homeward passages—a most important point, when the inferior quality of coals obtainable in America, and consequent diminution in speed, is considered. Her engines, we hear, are to be of 1000-horse power, and it is confidently expected that the average voyage across the Atlantic will be reduced to ten days. She will carry a vast spread of canvass, so that in all probability the engines will frequently be at rest. In consequence of the adoption of Smith's Screw Propeller, this stupendous ship, the greatest experiment in steam navigation ever made, will, we believe, be able to pass the present locks at Cumberland Basin, and discharge her cargo in Bristol Harbour. We congratulate our Bristol neighbors upon the enterprise which they are displaying. Two magnificent steamers are now building at Bristol, by Messrs. Acraman, for the Royal Mail Company; and, altogether, the ancient port seems to be "going a-head."—*Gloucester Chronicle.*

The Glass Trade.—It appears that plate glass polishers are rather in demand at the present moment, and that women in the receipt of not more than eight shillings a week wages, in St. Helen's, readily obtain engagements at seventeen and eighteen shillings at Birmingham and its vicinity.

ADVERTISEMENTS.

POTTS' PATENT PICTURE RAIL MOULDING, AND APPARATUS FOR SUSPENDING PICTURES.

The object of the patentee (in which he has completely succeeded) was to establish a convenient system for hanging pictures, uniting cheapness, elegance, and utility. The Rail can be adapted as the bottom member of the cornice, and saves the expense of a gilt mouding; it will carry the largest pictures without the least inflection, and can easily be fixed up in any room, even after decoration, without damage to the walls. The public is invited to inspect specimens, which may be seen daily, at 17, King William-street, Strand.

INSECURITY of IRON SAFES.—Any cast-iron safe may be easily broken into by a large hammer, and nearly the whole of the safes in common use can be burst open in a few minutes without making any alarm by a new burglar's instrument. CHUBB'S PATENT WROUGHT-IRON and FIRE-PROOF SAFES, Chests, and Boxes, possess perfect safety from all attempts to open them, and from the severe tests which they have undergone they will be found to give complete security from fire. Patent detector locks, street-door latches, cash-boxes, &c.—57, Saint Paul's Churchyard.

PLATOW'S PATENT AUTOMATON COFFEE URN.—The peculiar excellence of this invention, consists in the application of a series of natural processes to the preparation of coffee. The boiling water is raised by the elastic pressure of steam into a separate vessel, remote from the fire; where the coffee is kept simmering with the nicest regulation as to time, and the degree of heat. When the decoction is complete, the coffee is instantaneously cleared by the pressure of the atmosphere, acting on a self-formed vacuum. By following the directions given, any person, however little conversant with cooking, may prepare as good coffee as it is possible to make (see "Inventors' Advocate," No. 57, and the "Mechanics' Magazine.") Sold at moderate prices by all ironmongers.

THE comparative durability of STEPHENS' Unchangeable BLUE FLUID and common BLACK INK chemically explained. Black ink is the vegetable principle of galls united to a salt of iron. Iron has a constant and inherent disposition to absorb oxygen, until the vegetable principle decays, and leaves the manuscript in a state of iron mould. Ferro-prussiate, which is the basis of the unchangeable blue fluids, forms the deepest blue color when united to iron in the highest state of oxidation, and, if the iron is de-oxidised by light, the color passes to a lighter shade, but the constant disposition of iron to re-absorb oxygen is a never-failing source of the eternal preservation of the color; also the ferro-prussiate surpasses all other agents in its attraction for iron, and unlike animal or vegetable substances, which have an inherent disposition to pass to their original elements, it is not subject to spontaneous decay, and is unaffected by acids, or chlorine, which latter being used to bleach rags for paper-making, has been found to affect the writing from common ink. Stephens' Unchangeable Blue Ink is therefore more permanent and better fitted for all the purposes of writing than other colors.—Henry Stephens, 54, Stamford-street, Blackfriars-road, and sold by all stationers and booksellers.

FIRE PREVENTIVE CEMENT WORKS, Upper Ground Street, Blackfriars Bridge.—The Directors are now enabled, by means of the recent improvements made in the works, to SUPPLY Builders, &c., with the PATENT FIRE PREVENTIVE CEMENT at a very reduced price, for the utility of which they beg to refer to the various severe tests and experiments which have been made upon it in London, Manchester, St. Petersburgh, and Philadelphia, as reported in the Chronicle, Herald, and scientific publications at the period. See also the report in the Times of the 2d of September in this year, in which they state that, after the proof given of its resisting and non-conducting properties, it required only to be known to be universally adopted in all buildings.

HENRY FLOWER, Secretary.
J. B. SHEPHERD, Surveyor.

THE RAILWAY MAGAZINE, AND COMMERCIAL JOURNAL. By JOHN HERAPATH, Esq. Mines, Steam Navigation, Banks, Canals, Docks, Assurances. Published Weekly, price FIVE-PENCE Stamped, at Half-past Six on Saturday Mornings.—This long-established work (the oldest Railway periodical), being independent and wholly free from sinister influences, contains full and accurate Reports of all Railway Meetings, with Directors' and Engineers' Reports, and all information relating to Railways; unique Share Lists for London and Liverpool, &c.; the best Tables of Traffic extant, &c. Amongst other exclusive matter is the *Times of Starting of all Railway Trains*, giving most important information for travellers and commercial men. This Paper, which has the largest circulation of papers devoted to Mining, contains *Weekly Reports of Mining Companies*, exclusively furnished to it; Reports of the Meetings, Prices of Metals, Mining Intelligence, &c. For intelligence relating to Steam Navigation, the Magazine has long been known. It gives every week a *Steam Vessel Tide Table*, showing the time of tide every day for every port in England. On *Banking, Life Assurance, &c.*, much valuable original matter has been given in the Magazine, as well as upon all subjects relating to Joint Stock Companies. Accounts of new Companies, List of Meetings, Calls and Dividends, Share Lists, &c. Many original articles and much exclusive information are given on Scientific and Mechanical subjects, with occasional Engravings, Reviews, &c. As a medium for *Advertisements*, the "Railway Magazine and Commercial Journal," from the nature of its circulation, possesses peculiar advantages. Among the Advertisements which are inserted in this paper are—Companies.—Railway, Mining, Asphalte, Steam Navigation, Banking, Life, Fire, and Marine Assurance, Canal, Dock, Gas, Water-work, Cemetery, Paving, Dry Rot, and all Joint Stock Companies; Discount and Loan Societies. Sales of Shares, Landed Property, Collieries, Mining Materials, Iron Works, Foundries, Factories, Steam Engines, Actions, Contracts:—Public Works, Books. Travelling:—Railway Trains, Coaches, Steam Boats, Hotels, Patent Inventions. Engineering and Mining Colleges, Scientific Institutions, Exhibitions, &c.—Published at 3, Red Lion Court, Fleet Street, and to be had of all Booksellers and Newsmen.

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ACTS OF PARLIAMENT.

PATTERNS,—
27 Geo. III., c. 38; 2 Victoria, c. 13; 2 Victoria, c. 17 (The last relates to patterns and *models.*)

PATENTS FOR INVENTIONS,—
2 and 3 Victoria, c. 67.

SCULPTURES,—
38 Geo. III., c. 71.

ENGRAVINGS,—
7 Geo. III., c., 38; 17 Geo. III., c. 57.

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8 Anne, c. 19: 12 Geo. II., (Booksellers' Act), c. 36; 15 Geo. III, (Universities' Act), c. 53; 54 Geo. III. (General Copyright), c. 156.

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THE

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AND JOURNAL OF INDUSTRY;

A WEEKLY BRITISH AND FOREIGN MISCELLANY OF

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No. 69.] SATURDAY, NOVEMBER 21, 1840. [PRICE FIVEPENCE STAMPED. CIRCULATING FREE BY POST.

THE DIMINUTION OF FRICTION BY RAPID MOTION.

We stated last week, when considering the resistance offered by the air to rapid motion on railways, that the advantages to be derived from the proportionate diminution of friction at great velocities, would much more than compensate for the increased resistance of the air. We now propose to show the extent of this advantage.

In some articles recently published in our Journal, we endeavoured to prove that *time* is an essential element in the consideration of pressure, as well as of motion; and that the weight, or bearing, of any body is proportioned to the time which it remains on any given point. A single illustration will be sufficient in this place, to remind our readers of the position we took up.—Suppose a ball, of any weight or size, to be rolled along a flat level surface, at a velocity of ten feet a second; it must press on every part of the surface moved over with a force proportionate to its weight. If it be rolled with double the velocity, its pressure will be distributed over twice the space in the same time, and as the weight of the ball remains the same, the amount of force on any given point of its course must be diminished one half. The total amount of pressure exerted in the second of time is the same, but in the case of the doubled velocity, the space over which it is spread is doubled; and its intensity is, therefore, proportionally diminished. The application of this principle will show clearly the mechanical advantages to be gained by rapid motion in the diminution of friction on railways. For instance; the resistance to the motion of wheel carriages caused by friction, it is well known, increases with the weight or pressure on the axles and on the surface of the road; therefore, if we diminish the pressure by increasing the rapidity of the motion, we diminish the friction. The effect of increased velocity in diminishing resistance in traversing any given space on a railway, is, however, different on the friction of the axles from the resistance of the surface of the road, as we shall now explain.

The pressure of the load on the axles of the carriages is constantly the same, because there is, in that case, no distribution of the weight over a larger surface; it has the same point of bearing whatever may be the velocity. The gain in this case depends entirely on the saving of time, for as the weight at a double velocity rests on the points of bearing only half the time, the power required to overcome it is only half; or, what is the same thing, is only required for half the time. The advantage gained by diminution of resistance at the circumferences of the wheels, on the contrary, depends on the diminution of pressure. The weight at double the velocity is distributed over twice the surface, consequently its pressure on any given point is only half. The same weight is borne by twice the length of rails in one case, that presses on half the length in the other;—viewed in relation to time, it is the same in both.

These observations respecting the resistance of the surface only apply to a perfectly level and smooth railway, on which the hindrance to motion from the rails depends principally on adhesion, caused by weight. When the rails are uneven, or when the road inclines, the advantages of rapid motion, so far as the diminution of the surface-resistance is concerned, is decreased. On an incline, the weight of the whole train has to be lifted as well as to be drawn; and the increased velocity gives no advantage in lifting a weight. It has, on the contrary, the effect of diminishing the mechanical advantages of the inclined plane. For instance; when the velocity is doubled on an incline, the weight is lifted twice the height in the same time, and twice the power will be required to do it. Viewed in relation to time, there is no loss of power, but the quantity of force required to overcome the obstacle must be increased. When higher velocities, therefore, are required, the importance of having the road level is the greater. A gradient of 1 in 200, is to a train travelling at the rate of twenty miles an hour equal to a gradient of 1 in 100 when the speed is doubled, for the weight will have to be raised twice the height in the same time.

The pressure on the axles remains constant, whether the motion be rapid or slow, up hill or down; and it is in this friction that the great saving of resistance is made by increasing the velocity. The proportion which the resistance to motion from friction of the axles bears to the resistance presented by adhesion, inequalities, and inclines, on the peripheries of the wheels, may be stated at three to one. Putting out of consideration, therefore, the diminished resistance occasioned by diminished weight on the rails, we will take the surface-resistance to be in arithmetical ratio to the velocity, and confine our view of the advantages of increasing the velocity to the diminution of axle-friction only. It is not that we think the diminution of the surface-resistance unimportant, that we leave it out of consideration, but because its amount must depend greatly on the state of the road. In axle-friction alone there would be a gain of power to the amount of nearly seventy per cent. by doubling the velocity, and of one hundred per cent. if it were trebled; whilst the loss arising from increased resistance by the air was last week shown to be only in the proportion of 18 to 14.

For instance, if the force required to move a train at the rate of twenty miles an hour be 400 lbs., the obstruction of the road would absorb 100 lbs. of the power, and the friction of the axles 300 lbs. At double the speed, the power required would be 300 lbs. for axle-friction, and 200 lbs. for road-resistance, being together 500 lbs.; and at the speed of sixty miles an hour, the power required would, in the same manner, be 600 lbs. In the same time, however, the train would be propelled in the latter case three times the distance by the 200 lbs. additional power; omitting from consideration the increased resistance of the air.

It may be objected to this calculation of the advantages to be gained by rapid motion, that experience on railways proves the reverse of gain to accompany increase of speed. This result, however, does not prove the unsoundness of the principle for which we are contending, but the defective construction of locomotive engines for rapid motion. If that objection be allowed against the theory of diminished resistance to motion at increased velocities on railways, it would be equally applicable to passage boats on canals, where the fact has been proved,—and proved, too, in apparent opposition to the established law of the resistance of fluids. Though a speed of ten or twelve miles an hour on canals has been proved to occasion much less proportionate resistance than a speed of six or seven miles an hour, the slower speed is preferred, because the moving power is not adapted for greater velocities. It is the same with the present locomotive engines as with animal power. They are not adapted for very rapid motion; and when it is attempted, a great sacrifice of steam power is the consequence. Even at

the velocities common to the slowest trains on railways, a great loss of power results, owing to the construction of the engines not being fitted for imparting rapid motion. An engine which would draw a train of sixty tons at the rate of twelve miles an hour, is not able to draw more than forty tons at fifteen miles an hour; and at a velocity of twenty miles an hour, its power is reduced to drawing twenty tons only. Thus an addition of eight miles an hour to the speed diminishes the power of the engine two-thirds. This effect is to be ascribed entirely to the imperfect construction of locomotive engines; and does not arise from the increased resistance of the air or friction consequent on rapid motion. If an engine were constructed, able to exert its power advantageously at great velocities, we have no doubt that the advantages gained by increasing the velocity would fully equal our estimate. The power to be employed at higher rates of speed must necessarily be greater than at slower velocities; but the advantage gained by diminishing the time of its action, would far exceed the increase of power required.

PATENTS.—BRITISH AND FOREIGN.

ENGLISH EXPIRED PATENTS.

Henry Charles Lacy, of Manchester, coach-master, *an apparatus on which to suspend carriage bodies*, Nov. 18.

Bennett Woodcroft, of Manchester, *improvements in wheels and paddles for propelling boats and vessels*, Nov. 18.

SPECIFICATIONS OF ENGLISH PATENTS.

ENTERED AT THE ENROLLMENT OFFICE.

(Continued from page 307.)

John Davidson, of Leith-walk, Edinburgh, *an improved method of preserving salt*, Nov. 12.—This consists in constructing a box for the purpose of packing salt, that shall preserve the same from the humidity arising from the atmosphere, or from other sources. Claim.—Mode of preserving salt by packing the same in cases of wood, or other material, coated with oil color, or varnish, so as to resist wet or damp. Scale-board, or paste-board, is first coated with oil paint, varnish, or other waterproof composition; when dry it is passed between two rollers similar to those used by tinmen, by which means the ends will be brought together. They are then formed into an overlapping joint; the top and bottom are made by cutting slices off from a block, that has been turned to a proper size in a lathe, then fastening them with shellac, or other cement, just within each end of the hollow body, when the waterproof box will be formed; which, the inventor observes, will be rendered quite complete by having a piece of paper stuck over the overlapping joint of each box, which will hide the same, and on which his name and address may be printed.

Peter Bradshaw, of Dean, near Kimbolton, Bedford, *improvements in dibbling corn and seeds*, Nov. 12.—Claim first.—Mode of applying instruments to form holes in the ground, in combination with apparatus for dropping corn or seeds into such holes.

Claim second.—Mode of inserting corn or seeds, at intervals, by means of a roller and box, in a furrow or channel made for that purpose.

The shafts of the machine are fixed to proper framework, to which the main axle is also fixed; to each of the two wheels that carry the machine is fixed a toothed wheel, which, as the wheels revolve, take into other toothed wheels and set the working parts in motion. On an axle above the main shaft are fixed several eccentrics, to each of which is attached one end of a vertical rod with a spiral spring. The bottom end of each rod forms the pointed tool which enters the ground; the corn, or seed, is contained in a box which has an opening near the bottom. This opening is commanded by a roller in which there are notches at regulated distances, so that on the machine being drawn forward, the vertical rods move downwards into the ground, then take a slight turn round to form the sides of the holes clean, and then rise upwards while others are descending, and so on alternately; the roller connected with the seed-box revolves by the same movement, and as the notches reach the opening of the box a proper quantity of seed is allowed to escape, which, by the nice adjustment of the parts, then falls into a hole immediately beneath, and the roller continuing to turn the aperture in the seed box is closed until it reaches the next hole, when a corresponding notch in the roller allows seed to enter in the same manner as before. The spiral springs are in order to preserve the points of the instruments from injury, in the event of their striking against a stone or other hard substance, in which case the spring contracting allows of only a certain pressure to the point of the instrument, which would otherwise become injured.

The apparatus for inserting corn or seed at intervals is constructed somewhat in the same manner; only, instead of vertical rods moving up and down, there is a peculiar-shaped tool, which forms a clear groove or channel, into which the seed is dropped at intervals by means of a nearly similar arrangement of a roller and box, as above described. The inventor recommends that the man who attends the working of these improved machines should drive from behind, having the reins sufficiently long for that purpose, when he will be able to ascertain if it works correctly.

James Walton, of Sowerby-bridge, Halifax, cloth-dresser, *improvements in the manufacture of beds, mattrasses, pillows, cushions, pads, and other articles of a similar nature, and in materials for packing.* — These improvements consist in constructing pillows, pads, &c., of balls made of india rubber, and filled with air, by which construction articles are much less liable to receive injury of any consequence.

Air is pumped into a metal receiver, at the top of which there is a pipe and cock, above which a lever is so placed as to work up and down. In this lever, and just over the opening of the cock, an aperture is formed; a piece of thin india rubber is held tightly over the end of the pipe, and on the cock being turned the air rushes through, pressing the india rubber through the hole formed in the lever, which during this process is kept tightly down, and a ball filled with air is thereby formed; this is then tied round tightly close to the outside of the lever, and the edges cut off and cemented with india rubber cement. Another mode is by having two cups attached by a hinge which allows them to be thrown quite back; a piece of india rubber is then spread over both, and the air exhausted from underneath, the cups are closed, and the edges of the india rubber, which project all round, are cut close, when they will adhere together, and thus form a ball. Another mode is, by having two blocks of wood jointed by a hinge, and in each of which cavities are formed; in the bottom of these cavities are holes made through the wood; a sheet of india rubber is then placed over both blocks, and on the top of the sheet of india rubber a plate is laid, which has holes corresponding to the entrance of each cavity; the air is then exhausted by the holes underneath, and any soft material sifted or lightly spread over the surface. The plate of metal is then removed and the blocks closed, when a number of balls will be formed and connected together in the form of a sheet, by those parts uniting which were protected by the metal plate when the soft material was sifted over, which will thus form a lining to each ball, and prevent the parts adhering together inside, should they be brought in contact. These sheets of air balls may be used with great advantage in packing any goods of a frail nature.

Beds, and other articles, are formed by layers of these sheets of balls, having a thin sheet of india rubber placed between each layer; the space between each layer is filled with air, and the whole enclosed in an outer casing also filled with air, so that any articles made on this improved plan are only slightly damaged by an accidental puncture, which renders air goods made in the ordinary manner perfectly useless.

Bryant, J. Anson Bromwich, of Clifton-on-Teme, Worcester, *improvements in stirrup irons*, Nov. 13.— Claim first.— Mode of constructing stirrup irons, by the application of rollers to the same.

Claim second.—Mode of lining the bed of the stirrup iron with leather, or any other suitable material.

Claim third.—Mode of using rollers with fixed pieces of metal between them.

The stirrup iron is cased all over with revolving pieces, the straight part of the sides have hollow revolving standards, and the circular parts are covered with rollers somewhat in the form of large beads, and which also revolve freely, and by which means the foot of the rider may be easily disengaged in the event of his being thrown from his horse. The bottom or tread of the stirrup iron is made hollow, with sides standing up, and the space between is filled with leather or other material, which is fixed by screws passing into the same from the outside of the stirrup iron.

Henry Ernest, of Gordon-street, *improvements in the manufacture of machines usually called beer engines*, Nov. 13.—Claim first.—Mode of connecting together in beer engines a number of pumps for the purpose of drawing liquid from two or more butts, and also for regulating the quantity so drawn from each, in proportion to the other.

Claim second.—Mode of connecting two pumps by one lever, that the quantity of liquid drawn from the two butts may be equal.

The piston rods of the pumps are connected by links to bell crank levers, which act independently of each other; a cylindrical socket is sawn through its axis so as to form two semi-cylindrical pieces; these are connected to the bell crank levers which work on the same pin. The bottom part of the handle is formed to correspond with the two semi-cylindrical pieces, which are connected to the upper arms of the bell crank levers. Dovetail studs are formed on the bottom part of the handle; these take into corresponding slits in the semi-cylindrical pieces, in such a manner that if the handle is moved to the extreme point either way, one of these studs will escape its slit, and by this means allow of varying the quantity of liquid drawn from either butt.

Richard Foote, of Faversham, watchmaker, *improvements in alarums*, Nov. 12.—Claim.—Mode of letting off an alarum by means of the local heat;—also the mode of applying the works of a clock, with a suitable thermometer apparatus, for the same purpose.

A glass tube is bent so as to have a long and a short arm, the end of the long arm is closed and contains air; the end of the short arm is open, through which mercury is introduced which will rise to a corresponding height in the long arm, so that the space between the mercury and the closed end will form an air-chamber. A weight is suspended to a lever, and floats in the mercury near the top end of the short arm; to the other end of this lever there is a counter weight, which, like the other, is suspended by a guide rod, each passing through an aperture in another separate lever. In one a notch is formed, into which the bent end of a spring takes; to this spring a wire is attached, so that on an increase of heat the air contained in the glass tube will expand and force the mercury up. This causes the floating weights to rise, and thereby raises the lever which holds the bent spring, which is by this means set free and draws the wire forward, which thereby releases a weight, that then descends and causes a hammer to strike against a bell, and give notice of the fire.

The above may be applied to a common clock, and acted on through the works, as clearly shown

in the drawings, but without which an abstract would not be sufficient to describe it.

ENTERED AT THE ROLLS CHAPEL OFFICE.

(*Continued from page* 308.)

ARTHUR WALL, of 71, Wapping-wall, Shadwell, Middlesex, surgeon, *a new composition for the prevention of corrosion in metals, and for other purposes*, Oct. 15.—Claim.—A composition, as hereafter described, for the prevention of corrosion in metals, and for other purposes.

Twenty pounds of the strongest muriatic acid is diluted with about three gallons of water, and then placed in a shallow vessel made of cast iron; one hundred and twelve pounds of steel, or wrought iron filings, are heated to a red heat, and then thrown into the mixture; the whole is then to be placed in a sand bath and stirred repeatedly for twenty-four hours, or until ebullition takes place, and the greater part of the filings is taken up by the mixture; the oxides thus obtained are then allowed to run off into a vessel, leaving the metal not operated upon at the bottom. When the oxides are quite settled the clear liquid is run off into a third vessel, and the filings again made red hot, when the clear liquid drawn off into the third vessel is thrown upon them; and this procesa is to be repeated until all tbe filings have oxidized, that can be made to do so. The oxides are then exposed on an iron plate made red hot, until they also assume a red appearance. While they are in this state, sixteen pounds of quicksilver are sifted through a fine wire sieve on them, and the whole afterwards well mixed by being rubbed down in a mortar, or by any other suitable process, after which the surface is covered with water, and about eight or nine pounds of strong nitric, or nitrous acid, added, and the whole again placed upon a furnace plate or sand bath, and repeatedly stirred until the liquid has evaporated; the whole mass is then pounded until it is in a complete state of blackness. All the small particles are then washed out with water, and the whole allowed to settle. The water is poured off, and the sediment placed in a crucible, or earthen pot, with a receiver to receive any chloride that may escape; it is then made red hot, and while in this state plunged into fresh boiling water. It is atirred for a few minutes, and allowed to aettle. The water is then poured off, and when cool, the chloride is added, after which one fourth of its own weight of black, or red lead, according to the color desired. Previous to applying it to metals, linseed oil and turpentine are added in proportiona of one-fifth turpentine to the oil required to render it of a proper consistence to be easily spread with a brush, by which means it is applied as thinly as possible to sheeta of copper, or other metal, and which are afterwards aubjected to a heat gradually raised to about three hundred degrees Fahrenheit, so as to make the metal imbibe the preparation. It being necesaary to aupply the heat without smoke or flame, the inventor recommends the use of furnaces of a construction as hereafter described, which he has found most suitable for the purpose.

Two horizontal flues are erected which gradually decline towards the extreme end from the furnace bars, so as to produce a good draught, and a strong heat to the plate placed above, which covers the flues; the walls of the furnace are raised to from three to six feet above the iron plates, and are bound with iron braces, to keep them from cracking. A roof is then formed of thin aheets of iron slightly curved, and each end resting on the exterior walls. This arrangement will form a chamber, each end of which is closed in by a aliding iron plate, made to act as a damper, to let out or confine the heat. The heat from the flues ia carried away by a common chimney, which has a damper in it to control the heat; the sheets of metal prepared with the composition, as at first described, are then placed on iron trucks, between pins, running on wheels of four inches diameter, and are placed over the iron plate and made hot by the flues. The heat must be applied gradually to prevent the compound from blistering, which may be done by placing the trucks, first at the extreme end from the furnace bars, and gradually rolling them over the flue plates, until evaporation ceases, and the metal assumes a dark appearance, when the operation is complete.

AUGUSTE MOINEAU, of Philpott-terrace, Edgeware-road, Middlesex, clock manufacturer, *improvements in the construction af time-keepers*, Nov. 9.—These improvements apply solely to the means of impelling the works, and consist in certain novel modes of producing and communicating an impelling power, for giving motion to the works of clocks, or other stationary machines, to indicate mean time, by performing uniform rotary movements; in which construction the use of impelling springs is entirely dispensed with, and instead thereof a series of detached weights is adopted, which are raised and brought into operation when required by mesns of the impelling apparatus. The impelling power is applied to a main arbor, and communicated from this by a first toothed wheel; a large wheel with a series of arms projecting radially from its periphery, is fixed to the arbor, by which rotary motion is communicated. At the end of each arm there is a cup formed to receive a ball, and these balls being severally deposited in them upon one side of the wheel, produce a preponderating power on that side, causing it to revolve on its axis, and consequently the arbor which drives the works. A ball must be deposited in a cup every time an arm passes a certain point at the upper part of the wheel as it goes round, and will be discharged from the cups as the arms approach the lower point of their rotation. This, which is essential to the continued rotation, is effected in the following manner. A cylindrical straight tube is fixed, so as slightly to incline, at the upper part of the machine. One end of this tube is in connection with a bent tube. The straight tube receives the balls, through which they pass freely by its inclination, and then proceed to the bent tube, from which they are delivered successively into the cups as they pass round. In the end of the bent tube a small apparatus is applied to regulate the delivery of the balls; this consists of a small rectangular piece, fixed to and atanding up from the end of the long arm of a bent lever, which hangs in a bracket upon a fulcrum joint, and being weighted at the other end keeps the rectangular piece elevated, which thereby stops the ball. As the large wheel revolves, a tip on the side of each cup comes in contact with the top parts of the rectangular stop, and depresses it sufficiently to allow the ball to roll out, which is then caught in the cup, and by its gravitating force communicates rotary motion to the wheel; the stop then resumes its place by becoming again elevated, and as the cup containing the ball descends, the tip comes in contact with the outer end of a small jointed lever; at the back of this stops are attached, so that if the outer end be depressed the stops are brought down, and the next ball allowed to roll forward to the late position of the one just discharged, to be acted on in its turu in a similar manner, whilst the cup having passed the lever the stops rise again to their proper position in front of the second ball. A trough is placed below, and receives the balls as they descend. In this trough is fixed a small bent piece, and in each cup there is a corresponding alit, for tbe purpose of allowing them to proceed through the trough, without being impeded by the fixed piece, which by this arrangement comes in contact with, and displaces the ball. The ball then rolls into the trough, and from that into a tube connected, from which it passes into a cylindrical box, where it remains until it is carried up, and deposited in the straight tube at first described. One method of accomplishing this is as follows; the cylindric box is detacbed from the tube and connected by pivots to a long lever, which is mounted on a fulcrum pin in a standard. The shorter arm of this lever is attached to a rod connected by a crank to an axle below, in such a manner that if by any means the axle is turned round one quarter of a circle, at intervals, the attached rod to which is affixed the cylindrical box will rise first to a position at right angles with the standard, and then gradually higher until the box which contains the balls reaches the atraight tube, they being guided correctly in their passage upward by a small apparatus which we will next describe. On the box being raised a stop attached to the end of a weighted lever also rises, this prevents any of the remaining balls from running out of the inclined tube; as the cylindrical box is raised it is made to assume an inclined position by a tail piece on the end of the long lever, acting on a rim or bead on the outside of the box, so that when the box is raised to its proper height, its mouth is brought into the orifice at the end of the straight tube, into which it then discharges the balls, and on the crank rising the empty box descends to receive more balls and to be again acted on in a similar manner.

Another mode of carrying up the balls is, by allowing them to roll along the curved channel of the trough into the lower part of an inclined cylinder which contains an Archimedian screw pump, which is simply a worm in a hollow inclined cylinder, and on this revolving a ball placed at the bottom will be raised at the top by the continual increasing altitude of the plane of the spiral surface of the worm, rotary motion being communicated as follows: A vertical shaft or spindle is placed below the clock, and receives a uniform rotary motion by any convenient means. This spindle carries one bevelled wheel, which takes into another which is fixed on a horizontal axle. On the reverse end of this axle there is fixed another bevelled wheel, taking into a similar one on another axle, which also carries a second wheel. This takes into a pinion upon the axle of which there is another pinion in connection with a bevel fixed at the lower extremity of the hollow cylinder, so that, on rotary motion being given to the first spindle, the train of wheela and pinions connected therewith will cause the cylinder with the Archimedian acrew to revolve and raise the balls successively.

Claim first.—Any apparatus or means of effecting the movement of the axle before mentioned.

Claim second.—The apparatus described in the apecification, and clearly shown in the drawings for effecting that object.

This part of these improvements is too complicated to be distinctly described without the aid of drawings, we will therefore simply aay that the power may be obtained from either of the three following sources, viz:—the repeated opening of the room door; the rising and falling of water in a water-butt; or from an ordinary smoke jack.

RICE HARRIS, of Birmingham, *certain improvements in cylinders, plates, and blocks used in printing and embossing*, Nov. 12.—Claim first.—The manufacture of cylinders, plates, or blocks, made of, coated or covered with glass, or enamel, or any other vitrified aubstance containing silica and boracic acid, or either of them, sufficient to render auch cylinders, plates, or blocks capable of being etched by the action of hydrofluoric acid alone, or in combination with ammonia or other base, and to be used in printing cotton, linen, woollen, ailk, and other similar fabrics.

Claim second.—The use or application of tubes or lininga for cylinders made of copper, brass, or other expensive materials for printing or embossing cotton, linen, woollen, silk, and other similar fabrics, by which means such cylinders are made of a amaller quantity of the more expensive materials of which they are composed, without increasing the weight or size of the axis or mandril to be used with them.

The printing plates or blocks may be cast in moulds in the usual manner. The cylinders require an apparatus of the following description.

A cylindric mould of cast iron ia formed of three pieces, and braced together by flanges, and afterwards bolted at the bottom to the foundation plate of an ordinary screw press; a hollow tube is fitted to the same plate, and constitutes a core for forming the opening through the intended cylinder. A funnel fits lightly to the entrance of the mould, and a piston fits the interior, and is attached to the screw of the presa in any ordinary manner. The piston or plunger has a cylindrical passage to receive the core when it is screwed down. A pipe leads from the bottom of the tube to an elevated tank, which admits water, and so prevents the tube from becoming

pused, and adhering to the vitrified metal; another ipe is placed at the top, which carries off the steam nd the surplus water. The vitrified matter is oured into the funnel, and the plunger screwed own, which compresses it in the mould. When eool the cylinders are ready to be annealed; this is done by taking the mould to pieces, and then enclosing the cylinder in a case of sheet iron, which is open at on: end, and made larger than the cylinder, that a va ant space may be left on every side; this is filled with powdered charcoal, and then closed so as to exclude the air; the whole is then placed in an annealing kiln, similar to those used by flint-glass manufacturers, and the process is conducted in the same manner.

The mode of etching is by giving the surface a coat of common etching wax, on which the design is transferred; the wax is then removed by a pointed tool; in those parts required to be engraved, in a similar manner to copper-plate engraving; and the plate or block is then immersed in hydrofluoric acid.

HENRY DIRCKS, of Liverpool, engineer, *certain improvements in the construction of locomotive steam engines, and in wheels, to be used on rail and otherways, part of which improvements are applicable to steam engines generally*, Nov. 13.—Claim first.—An mproved construction and arrangement of the exhaust or exit pipe, used in combination with a tubular boiler.

The exit pipe is placed in the smoke box of the engine, in which a series of small branches or tubes are arranged, so that they may be opposed to most of the ends of the boiler tubes. The exhaust pipe branches or tubes, are perforated with small holes on that side of the pipe opposed to the tube ends. Through these the steam will blow out upon the orifices at the end of the boiler tubes in very fine jets, and so prevent the emission of smoke, and this part of these improvements is applicable to steam engines in general.

Claim second.—The combination of a metallic wheel with a wooden faced tyre, without being confined to the precise mode of construction or putting together.

The tyre is composed of cast or wrought iron, having a groove formed therein; this groove is to be filled with blocks of wood, having the grain placed vertically or end ways all round in segments, which are afterwards bolted, rivetted, or otherwise fastened in the channel of the tyre, and presents a wooden faced rim or running surface to the road or way. The wood which answers best is African oak, British oak, beech, or other hard wood, previously soaked or saturated with coal gas tar, and impregnated therewith either by hydraulic or other pressure, so as to fill up its pores and prevent the admission of moisture; or instead of hard wood, larch may be employed, by being squeezed or pressed into more perfect solidity; the pores may also be filled by any oily substance, either pressed into them or introduced by vacuum or other means.

ENTERED AT THE PETTY BAG OFFICE.

(Continued from page 261.)

MILES BERRY, of Chancery-lane, Middlesex, *improvements in treating, refining, and purifying oils*, being a communication, Nov. 7.—Whale oil is heated by the steam of water to 45 deg. Raumer; a clear solution of chloride of soda at abont 15 deg. is added, and the whole well stirred for twenty minutes. It is then placed in appropriate vats, and left to repose for three days; it is then to be decanted, or poured off the precipitate, and treated with an infusion of acid of nut galls, or gallic acid; the whole is then to be stirred for fifteen minutes, and nitric acid added in the proportion of two ounces to every hundred pounds; and after having reposed it will have become perfectly purified, and free from smell, and ready for the next process. This consists in separating the olein from the stearine, and it is effected as follows.

Acetate strychine, nitrate potash, and chromate of lime, are each added to the oil in proportions of two pounds to every hundred pounds of oil, being first dissolved in water at about five per cent.; after these are added to the oil, the whole is stirred for twenty minutes, and left to repose for a day, and then put into felt bags of a conical shape, when the olein will pass through, and the stearine remain: this may be subjected to strong pressure to render it more solid.

NOTICE TO PATENTEES.

The following is the form of notice given to patentees, of the intended publication of the specifications of their inventions in our journal. The notice, it will be seen, is now extended to two months, instead of one:—

"PATENT OFFICE, 198, STRAND,
"Mr. *London*, 184
"SIR,

"We beg to inform you, that it is the invariable rule of the "INVENTORS' ADVOCATE," Weekly Journal, of which we are the Proprietors, to publish the Specifications of English Patents immediately after they are enrolled. We also think it proper to draw your attention to the fact, of which, perhaps, you are not aware, that *after the description of an Invention has appeared in print, Patents cannot be obtained for that Invention in many Foreign States.*

"The practice of our Journal, which we have alluded to, has given rise to much controversy, on the ground of its being injurious to the interests of Patentees. We have readily given insertion to the strictures of various Correspondents on this subject, and conceive we have completely justified ourselves by showing, that from the moment the Specification of an English Patent is enrolled, any person is at liberty to examine it, and to take out Foreign Patents for the Invention, without the sanction or knowledge of the Inventor. For further particulars on this point, which is of such vital importance to English Inventors, we refer to Nos. 25, 26, 30, 34, and 35 of the "INVENTORS' ADVOCATE," in which we expose a practice which has long prevailed (with a class of persons who watch the enrollment of Specifications) of surreptitiously taking out Foreign Patents for English Patent Inventions, and so defrauding the Inventor of his rights.

"With a view, therefore, to afford protection to Inventors generally, and to leave them no room to complain that they have been taken by surprise, we have adopted the rule of giving them notice of the intended publication of their Specification in the "INVENTORS' ADVOCATE," in sufficient time to secure their Foreign Patents, before it appears in print.

"In conformity with this rule, we have to inform you that the Specification of your Invention of

due the will appear in the "INVENTORS' ADVOCATE" immediately after it is enrolled.

"We take this opportunity to offer our services to secure the Foreign Patents for your Invention, and to state that the arrangements we have made for Foreign Patent Ageney, together with our extensive experience in that branch of business, enable us to offer peculiar advantages to our Clients.

"Having our own Offices and Agents in all the Continental Capitals, and being perfectly well versed in the Foreign Laws of Patents, we take out the Patents for an Invention in several Foreign Countries *simultaneously*, on a well-combined plan, with secresy and despatch, without compromising the interests of the Inventor. From the want of proper attention to the laws of different countries, as they bear upon each other, Foreign Patents are often lost, and Inventors are put to a great deal of useless expense.

"An erroneous notion prevails, that the Foreign Patents for an Invention cannot be taken out without danger to the English Patent, before the Specification is enrolled. Inventors, by their fears on this head, frequently lose the benefits which the Foreign Patents would produce if taken out in time. We can satisfy you that such fears are groundless, and will readily advise you on the course to be pursued.

"Should you require information to guide you in the selection of the Foreign Countries in which it would be advisable to take out Patents for your Invention, we shall be happy to afford it to you, gratuitously, and will send you our Scale of Charges, which we have regulated so as to secure the most important of the Foreign Patents *at a small expense.*

We are, Sir,
Your obedient Servants,
DELIANSON CLARK & Co."

FOREIGN PATENTS.—FRANCE.

SECOND QUARTER OF 1839.

(Continued from p. 309.)

80. Doumergne and Velliet, 5 years, for *a new double-bottomed pot for the purpose of heating combs*, May 11, 1839.

81. Haley, J., 15 years, for *improvements in the apparatus for preparing the warp threads*, May 11, 1839.

82. Hall, Pauwels, and Scott, represented by Perpigna, for *improvements in the machines for pulling cloth*, May 11, 1839.

83. Pilaud, J., addition to patent for 5 years, dated Sept. 29, 1838, for *machinery for increasing horses' power*, May 11, 1839.

84. Pavin de Courteville, L. H., 10 years, for *a machine for elevating running water by the motive power of the stream*, May 11, 1839.

85. Rinaldi, J. T., 5 years, for *a remarkable alteration in pianos*, May 11, 1839.

86. Lebrun, A, 5 years, for *a new microscope applied to a telescope*, May 11, 1839.

87. Wickham, J. J., represented by Truffaut, 10 years, for *a new process of making trusses, applicable to both sexes*, May 11, 1839.

88. Bastiné, C. F., 5 years, for *new machinery for decreasing the friction and traction or rotation in most land and maritime locomotive engines*, May 11, 1839.

89. Chabert, C. E. F., 10 years, for *means of producing from the colza stalk a substance to be used instead of rags in the manufacture of paper*, May 11, 1839.

90. Corbin de Boissieres, 10 years, for *a casting apparatus*, May 11, 1839.

91. Molerat and Co., 5 years, for *razor-cases*, (2d addition,) May 11, 1839.

92. Richard, F. L., 5 years, for *an inodorous liquor for cleansing instantaneously furniture, gilt objects, brass, gold, silver, &c.*, May 11, 1839.

93. Roger and Co., 5 years, for *a new alarum*, May 11, 1839.

94. Thibert, P. L., 15 years, for *the manufacture of the "carton pierre," applied to natural sciences, and to comparative anatomy*, May 11, 1839.

95. Adorni, F., 5 years, for *an urano-graphic and astronomical machine*, May 22, 1839.

96. Arrault, H., addition to patent for 5 years, dated Sept. 7, 1838, for *a nutritious substance called "pâte de lait,"* May 22, 1839.

97. Beners, P. L. J., 5 years, for *new processes of manufacturing permeable and waterproof pasteboad*, May 22, 1839.

98. Debarbes, J. B. J., 10 years, for *a process of manufacturing hats impermeable to perspiration, applicable to all articles to be preserved from damp*, May 22, 1839.

99. Delacroix, R. A., addition to patent for 15 years, dated March 31, 1838, for *a process of making bread*, May 22, 1839.

100. Duval, A., 5 years, for *a new spring buckle and curb for fastening clogs*, May 22, 1839.

(To be Continued.)

FOREIGN PATENTS.—BELGIUM.

LIST OF PATENTS RECENTLY GRANTED BY THE BELGIAN GOVERNMENT.

(*Continued from No.* 67.)

R. W. Urling, of St. Josse-ten-Noode, rue des Arts, 139, a patent of invention for 10 years, for *improvements in tubes, pipes, and cylinders*, Oct. 28, 1840.

L. Semet, son, address at Ghent, rue des Semences, a patent of invention for 15 years, for *a new process of manufacturing alum*, Oct. 28, 1840.

C. Wheatstone, address at M. Quetelet's, Brussels, a patent of invention and improvement for 15 years, for *a new system of telegraph for communicating signals, and giving alarm, by means of electric currents transmitted through wires*, Oct. 28, 1840.

J. B. Bakewell, of London, represented by Dixon, of Brussels, Hôtel de Groenendael, a patent of importation for 5 years, for *improvements in the construction of railroads, and in the means of applying motive power to driving carriages thereon*, Oct. 28, 1840.

J. T. Russinger, of Brussels, rue Royale Neuve, No. 53, a patent of invention for 15 years, for *a machine for making bricks, tiles, &c.*, Oct. 31, 1840.

W. Maltby, and R. Cuerton, of London, represented by Dixon of Brussels, Hôtel de Groenendael, a patent of invention for 10 years, for *improvements in extracting and concentrating, the tannin color, and other matters contained in animal and vegetable substances*, Oct. 31, 1840.

Romain Couvert, of Brussels, rue du Curé, No. 7, a patent of invention and improvement for 10 years, for *improvements in lithographic presses, without pedal or stirrup*, Oct. 31, 1840.

Charles Corbrun, of Liege, rue sur Meuse, No. 576, a patent of invention for 5 years, for *a stove with current of heated air*, Oct. 31, 1840.

W. H. Ritchie, of London, represented by Dixon, of Brussels, Hôtel de Groenendael, a patent of importation for 5 years, for *improvements in the manufacture of candles, and in working oils and fats*, Oct. 31, 1840.

Moses Poole, of London, represented by Dixon of Brussels, Hôtel de Groenendael, a patent of importation for 5 years, for *improvements in hinges*, Oct. 31, 1840.

FOREIGN INTELLIGENCE.

FRANCE.

The new Minister of Trade has addressed the following circular to the members of the chambers of commerce, agriculture, and manufactures, in different parts of France, relative to the propriety of calling a general meeting of those chambers, for the purpose of discussing the affairs connected with the internal interests of the country:—

"Gentlemen,—Two years are elapsed since the last session of the councils general of agriculture, manufactures, and commerce. Summoned for the second time to undertake the direction of the administration to which is attached the great interests of those three important branches of general economy, I have considered whether the time is not arrived when theso councils should be re-united for a general deliberation, and I am desirous of knowing your opinion on this subject.

"The session of 1837, as you are aware, was a very busy one: important questions were discussed, and, notwithstanding the great solicitude of the administration, many of them have not yet been decided.

"Thus, the question of importing foreign cattle, a question which involves so many interests, has for two years been a subject of mature consideration; this investigation still continues: it involves the rates of the town dues, as well as the duties of customs; and if the question continues undetermined, the reason of it is, that in some of its bearings it has an influence on negotiations, the details of which it is impossible to make known before they are concluded.

"The project of law, with respect to ingenious patent inventions, has been considered with the deliberation suited to so important a subject. It is ready to be submitted to the test of legislative discussion, and the examination that it has undergone in the committee will certainly entitle it to the confidence of the two Chambers.

"The proposition relative to the working of children in manufactories was last year discussed by the Chamber of Peers; it is in the course of report to the Chamber of Deputies, and will be resumed at the commencement of this session. No subject is worthy of a higher degree of consideration from government. The deliberative chamber of arts and manufactures, the council of Prud'hommes, the chambers of commerce, the councils general of the departments, have been summoned to consider it again; and this inquiry, commenced and finished during the Parliamentary recess, is confirmatory of the wisdom of the councils, and will prove a desirable support to the expression of its opinions.

"Many other questions which were discussed in the course of the same session, such as sugars, linen and hempen threads and fabrics, marine steam engines, the expense of custom-houses in the interior stations, prohibitions which affect the export of a great variety of merchandise, have been determined either provisionally or definitively. The greatest number—and I shall particularly mention the public sales of merchandise; the jurisdiction of the council of Prud'hommes; security against fire; the responsibility of ship-owners, &c., —still engage my attention, and will not require to be again submitted to the deliberation of the councils.

"Thus situated, notwithstanding my wish to apply for the assistance of the councils of agriculture, manufactures, and commerce, for the information necessary to the accomplishment of the task confided to me, I feel very unwilling to take from their occupations for a month so great a number of proprietors and masters of manufactories in all parts of France, without being able to justify the propriety of such a measure, by the importance and suitableness of the questions to be submitted to them.

"Yet, gentlemen, I do not wish to make any decision without previously consulting all the chambers of commerce and manufactures. I desire they will acquaint me with the recent questions of general interest, which, in their opinion, may be the object of deliberations of immediate utility; and if I find the proposal of a session desirable for the three councils, I shall certainly consider it my duty to endeavor to obtain one by proposing to his Majesty to fix a session for the month of next March.

"I intreat you, gentlemen, to consider with attention the observations I have submitted to you, and to transmit your answer before the end of the month. L. Cunin Gridaine."

At a late meeting of the Society of Arts and Manufactures, at Mulhausen, the president communicated a note from M. Mallet, president of the Society of Manufactures at St. Quentin; and also recalled the attention of the society to the process of Messrs. Neron and Co., to preserve steam-boilers from the incrustations which injure them. The president proposed to send the note in question to the committee of mechanics, who gave an account of the successful results obtained by the process of Messrs. Neron and Co., a process already applied in the manufactories in Alsace. The object of this reference, the president said, was, that the process in question may be taken into consideration, and that the results may be made known to the manufacturers, who have not yet tried, or who have made an imperfect application of it.—The proposition was adopted.

The Academy of Science, Literature, and Arts, at Rouen, will award, in its general meeting in the month of August, 1841, a golden medal of the value of 300 fr. to the best memoir on the following subject:—To ascertain the effect produced on the health of workpeople of both sexes, and of every age, by the weaving of cotton, either by the hand or by machine, by endeavouring to make known the particular influence of their habitations, their domestic habits, the fabrics manufactured, the substances employed, and of the different mechanical proceedings. Also to ascertain, and to propose the most effectual remedy for, the inconveniences which may be stated in the first part of the memoir. The same Academy proposes, as the subject of an extra prize, suggested by M. L'Abbe Grossier, the following question:—To inquire into the present system of teaching mathematics in the colleges, and to make known the result on the majority of pupils. If the author does not consider this result a desirable one; what method can be substituted for the one in use? If the plan proposed for teaching mathematics should interfere with the classics, the necessity of such an alteration must be pointed out, and it must be carefully considered how far it may infringe on literary studies. According to the terms of the will of M. L'Abbe Grossier, the town of Rouen is left legatee of the sum of 20,000 fr., the interest of this for a year is to be the value of the proposed prize.

A mine of lead, copper, and antimony, mixed together, has been discovered in the commune of Murmand, situated at a distance of two kilometres from Thizy (Rhone), in a pass intersected by a rivulet named Murmanton. One hundred kilogrammes of mineral extract was found on analysis, to contain 26 kilog. of lead, 16 of copper, 10 of antimony, and 18 of another mineral which has not yet been designated; the surplus consists of earthy substances. The thickness of the metallic vein discovered is from one metre and a half at least, and the mineral is more abundant as the works proceed. It is said that two workmen can extract 15,000 kilog. in a day.

The number of French departments where coal is worked is 33. It is calculated that there are 224 mines, of which 160 are worked, and 64 not worked, which occupy a space of 283,114 hectares, definitively granted, and 5,628 which are only granted provisionally. In these coal-mines there are 523 pits, and 162 in which the galleries are on a level, of a maximum depth of 476 metres. It is calculated that there are in these mines 317 steam-engines and 129 molettes; 23,751 men are employed in working them; the produce of the working is upwards of 29,446,947 metrical quintals, representing a value of 29,078,083 fr., which is equal to an average price of 0.98 fr. per metrical quintal, and 0.79 fr. per hectolitre.

The *Echo of Luxemburgh* says:—"A chemist at Luxemburgh, who is also a celebrated physician, with whom we have had occasion to discuss the affair of Madame Laffarge, has communicated a fact to us which we consider it a duty to make generally known. He has submitted to analysis different kinds of paper, and he has discovered in pieces not larger than the palm of the hand a quantity of arsenic as great as that found in the body of Laffarge. Hence it results that an individual who has the habit of chewing paper, or who even only chews it accidentally, must necessarily absorb a certain quantity of arsenic. The following is the manner in which the existence of arsenic in the paper has been explained to us. The first ingredient in almost all papers is linen rags. Now, the colours of these rags are generally produced by a preparation in which there is a great deal of arsenic, which must remain in the paper."

The Toulon papers of the 8th inst. mention that the *Astrolabe* and *Zélée* discovery ships had just cast anchor in that harbour, after their long and perilous voyages. Their arrival is said to have excited a great sensation in the port, as their fate had for a

length of time been doubtful. Science and navigation will be greatly enriched by the valuable materials collected by M. Dumont Darville; the acquisition of which, however, has cost many valuable lives. It was on the 8th September, 1837, that these two corvettes left Toulon to commence their adventurous expedition; there has, consequently, been an interval of thirty-eight months between their departure and return.

The *Astrolabe* lost eight men, owing to an epidemic dysentery, during the voyage; another man died from lock-jaw, and another fell overboard. The crew of the *Zélée* suffered still more. She lost nineteen by dysentery; and two others died of scrofula.

[Some of the discoveries made by these ships in the course of their voyage in the antarctic circle have been already noticed in the *Inventors' Advocate*; particularly the discovery of a south-polar continent, or large island. We shall endeavor to procure the earliest accounts of any other discoveries the ships may have made in the course of their long voyages.]

Consumption of Paris.—There was consumed in the month of last October 6,510 oxen; 1,699 cows; 5,769 calves; and, 38,017 sheep. There were also received 504,341 kilogrammes of melted fat. There was consumed in October, 1839, 5,594 oxen; 1,703 cows; 6,066 calves; and 35,170 sheep. In that month there was received 481,776 kil. of melted fat.

BELGIUM.

At the meeting of the Royal Academy of Science and Belles Lettres at Brussels, on the 7th inst., M. Quetelet announced that on the evening of the 29th of last October he observed a phenomenon, which he thought was to be attributed to the aurora borealis. About twenty minutes to eight o'clock, he was informed that something very extraordinary was taking place in the atmosphere, which was then entirely clouded. Small rain fell at intervals; a wind from the south-east rapidly drove the thick clouds; but, in passing towards the direction of the pole, and over a circular extent of from seven to eight degrees round this point, these clouds became clear and bright, as though they were passing over the moon in her greatest splendour. The sky, though clouded, was uniformly illuminated in the vicinity of the horizon towards the north. This phenomenon continued more than half an hour, maintaining nearly the same position, and without openings of the clouds to disclose the sky. Many persons were assembled at this time at the Observatory, among others, Mr. Babbage, and were witnesses of this phenomenon. On this subject M. Quetelet placed before the Academy a general list of the auroræ-boreales, of the aerolites, and the extraordinary appearances of shooting-stars, which he purposes inserting in the annual of the Observatory of Brussels for the year 1841. His principal object is to afford a general opportunity of ascertaining if these phenomena are periodical, and at what time of the year it is most necessary to pay particular attention to them. He gives, at the same time, the following extract from a second letter which he has received from M. Copocci on the supposed periodicity of aerolites:—"It appears that the periods for aerolites which I have indicated in my memoir have been verified this year; that in particular indicated for the 29th of July appears to have taken place on the 26th, three days earlier than the average period mentioned. The same thing occurred with respect to that of the 18th of August, which appeared on the 7th. There is another more certain proof that aerolites are periodical. I have just discovered it in the fall of a similar meteor to that which was visible in Lombardy on the 7th of last July. The same day is indicated in the catalogue which accompanies my memoir sent to the Academy of Naples."

The committee for arranging the fêtes at the inauguration of the statue of Grétry was appointed on Saturday at the sitting of the common-council. It consists of Messrs. Piercot, Lambinon, Lion, Nagelmackers, and Detrasse. These gentlemen will add a certain number of members, selected from the musicians, painters, and literary characters of Liege.

RAILWAY INTELLIGENCE.
DOMESTIC AND FOREIGN.

Northern and Eastern.—The number of passengers during the week ending November 10, was 4,779, and the total receipts £371 15s. 2d.

RAILWAY ACCIDENTS.

Fatal Collision on the London and Birmingham.—On Thursday, 12th inst, an accident occurred near the Harrow station from collision, caused by inattention of an engine-driver, which terminated fatally to the man himself, and to the fireman of another engine. The official report of the accident gives the following particulars of the occurrence.

"The first of the merchandise trains, which reaches London about three o'clock, had, yesterday (12th inst.) afternoon, arrived at one mile and three quarters on this side of Harrow, when one of the wagons broke down, and five wagons were in consequence thrown off the rail. Immediate notice of the accident was sent to the Watford, Harrow, and Camden stations, to prevent the possibility of any collisions with the trains then passing along the line; and accordingly three successive passenger trains arrived, without interruption, in London at the appointed times. On the first intelligence of the occurrence, an engine was despatched from the Camden station with assistance for clearing the up-line. The necessary measures were in progress for this object, and the engine from the Camden station proceeded to Harrow for further aid; whilst there, the second merchandise train, which arrives in London about half-past five, made its appearance, drawn by two engines. The driver of the leading engine of the train noticed the signal to shut off the steam, and gave notice to the driver of the next engine to do the same, but which, from the concurrent testimony of the policeman and porter at the Harrow station, was unfortunately not attended to, although the policeman ran forward and put up his lamp close to the engine. The driver of the engine then waiting at the Harrow station was in communication with the station clerk.

"The fireman, who was with the engine, put it in movement towards London, as soon as he saw that the train, notwithstanding the signal, was still advancing. He could not, however, get sufficiently a-head to prevent the train running into him, about 50 yards from the spot where he had been waiting; his engine and the leading one of the train received very trifling injury from the collision. The second engine was thrown off the rail, with several of the wagons, and the driver, Simpson, was killed, it is supposed, from jumping off, and the fireman hurt. The driver of the leading engine escaped without injury; but the fireman was found dead under the wagon wheels, having, it is believed, also jumped off.

"All the necessary precautionary measures having been promptly taken for the prevention of accidents, and promptly attended to by the passenger trains, no other inconvenience was sustained by them than that which arose from the delay caused by the impediments on the line."

An inquest was held on the bodies of the two men on Monday before Mr. Wakley. That gentleman in addressing the jury alluded to the observations made by the coroner at the recent inquest on the woman killed at the Southampton railway, and denied that the exposition of the law then made was correct. Mr. Wakley said the words made use of by the coroner on that occasion, so far as he recollected them, were that the jury "could take cognizance of an act done, or of the undoing of something that had been done, but they could not take notice of a mere omission of duty, however blameable it might be." Now he (Mr. Wakley) would say, that such a doctrine was downright absurdity. If such were the law, then there must be at once an end to all security against such accidents. He had no hesitation in saying that there was no such law on the statute-book, nor was any such law recognised in this country. On the contrary, he would maintain that a person was as much responsible for the consequences of neglect of duty, as for the improper performance of such a duty through which a death might ensue. If this were not the case, what would be the condition of railway directors? They could not be everywhere. They could not be engineers, stokers, and policemen. The responsibility attached equally the same to the directors as to the lowest labourers on the line, if neglect could be proved. If death arose from neglect of duty, it might in the eye of the law be not only considered a case of manslaughter, but the neglect might be of so gross a character that the law would imply malice prepense, and convert it into an absolute case of murder. For instance, let him suppose a man about to be discharged for misconduct; nothing would be more easy for him than to cause an accident by neglecting to hoist a certain signal, or not to notice it when hoisted, and if the law laid down in the case to which he had referred was correct, the person so offending would escape, and the innocent suffer."

The evidence at the inquest before Mr. Wakley bore out the official report of the accident given above, in all its main points; excepting that it appeared the driver of the engine had left it in charge of the fireman whilst he went with a policeman to a public-house to purchase refreshments for the men at work down the road. The fireman during his absence finding the other train was arriving put on the steam, but seeing that a collision was inevitable, he again shut off the steam, and jumped down before the engines struck. At this inquest, also, some important evidence was given as to the ignorance of the class of men who are now entrusted with the charge of locomotive engines. James Bradburn, the engine-driver, who had left his engine at the Harrow station, against which the goods' train struck, said he had been an engine-driver for seven years, two of which he had been employed on the London and Birmingham line. When asked to write his name, he said *he could not write*, but he made an attempt to spell it. A gentleman connected with the company stated that there was a copy of printed instructions hanging up in the office, but *instructions were often given verbally to the men on the engines, as in many cases they could neither write nor read.* The wages Bradburn received were two guineas a week, and extra for Sundays. It appeared also from the statement of Finch, the fireman who deserted the engine when he found the other train was gaining upon him, that Simpson, the driver of the second engine of the wagon train, was considered by him careless. "*He was a very fast driver, and he was very fond of sitting down* on the seat by the hand railing of the foot plate." The inquest was adjourned till Thursday.

On Thursday several other witnesses were examined, and it was determined to adjourn the enquiry again until Wednesday next, as the coroner thought it was important they should have the opinion of Sir Frederick Smith the railway commissioner, who has gone down to enquire into the cause of the York and North Midland railway accident.

Fatal Collision on the York and North Midland.—A collision of trains occurred on this railway at its junction with the Leeds and Selby, on Wednesday evening, the 11th inst. The collision took place near seven o'clock at South Milford. The train had arrived from Leeds, with passengers for York and Hull—there being three carriages for each place; Bland, one of the Hull and Selby guards, having come from Leeds with the train. The carriages for York were separated from those for Hull; and the former were about 60 or 70 yards in advance, when a train with goods came up, with one of the York and North Midland engines attached to it, and ran into the train intended for Hull, damaging all three carriages by the collision. That next to the engine was a Hull first-class carriage,

No. 1, which was completely smashed; the next was a second-class York carriage, which was also much broken; the third was a third-class Leeds carriage, that did not receive much injury.

Bland was on the foot-board of the first-class coach when the engine ran into it. There was only one passenger in the compartment first struck by the engine, viz., Mr. Pattison, a printer of Leeds; he was killed. No other person in the first-class carriage was severely hurt. A woman, named Cousins, the widow of a shoemaker at Selby, who was in a second-class carriage, had her hand taken off, and she received also such severe injuries on the head that she died shortly afterwards. This accident arose from some culpable carelessness on the part of the driver of the engine; as it was clear moonlight at the time, and it is said there was a red light at the back of the carriage against which the engine rushed. Inquests have been held on both bodies.

The inquest on the body of Mr. Pattison was resumed on Friday, and again adjourned till Saturday, on which day the engineer of the wagon train which caused the accident was examined. Mr. Thomas Cabrey, the managing director of the railway, had previously expressed himself strongly in favor of Watkins, and said he would trust him as soon as he would trust himself. From Watkins's evidence it appeared that there was no red light shown till he was within 150 yards of the train in advance. He then reversed the engine, and gave directions to have the break put on, which was done, but owing to the slight fog and the slippery state of the rails he could not stop the train before he came to the other. He said he saw nothing but white lights at the station, until the red one was displayed when at the distance he stated. The coroner in his summing up recommended the jury to be moderate in the amount of any deodand they might award, as there appeared to be no wanton neglect on the part of the company or their servants. The jury returned the following verdict:—"We find that Henry Pattison was accidentally killed, and we levy a deodand of £500 on the Zetland engine, the property of the York and North Midland Railway Company."

The parties present connected with the railway expressed themselves strongly to the effect that the deodand was excessive, and that the matter would probably be removed into the Queen's Bench. The inquest on the body of Mrs. Cousins, is not yet ended.

Another Collision on the Eastern Counties.—On Sunday morning, another accident occurred on this line, from one train running against another; by which several passengers received severe injuries, though fortunately no one was killed. The following official statement of the accident has been drawn up by the directors of the Eastern Counties and the Northern and Eastern Counties Railways. "The 10 o'clock Eastern Counties down train left Shoreditch at five minutes past 10 o'clock, and stopped, as usual, at Devonshire-street and Bow, at which latter station one passenger was put out. The train then proceeded onwards, but was slackened in its progress by some of the passengers calling to the engine-driver for the purpose of letting two persons get into the train who were running from the station. In the meanwhile a Northern and Eastern engine, unaccompanied by any carriages (which had left Shoreditch 10 minutes after the Eastern Counties train), arrived and came into collision with the Eastern Counties train, whereby we regret to state that a poor woman sustained a simple fracture of the leg, just above the ancle, one gentleman was severely bruised, and two others sustained some slight injuries. At the present time the medical men report that the sufferers are doing well." Several of the passengers, who saw the coming danger, jumped out of the carriages, before the collision, and thus avoided the consequences of the shock. The accident is attributed entirely to the recklessness of the driver, who was seen by the passengers approaching at a rapid rate when he was at a distance of 600 yards, consequently he might have seen the train in ample time to have stopped his engine.

The Boiler Explosion on the Birmingham and Gloucester.—We mentioned last week that two men were killed at the Bromsgrove station, on the Birmingham and Gloucester railway, on Wednesday, by the explosion of the boiler of Dr. Church's locomotive engine, which had been put on the road as an experiment to try its powers. An inquest was held on the bodies of the two men on Thursday, at which the following evidence, descriptive of the accident and its cause, was given:—

Inshaw, the engineer of Dr. Church's engine, said that he had had the engine under his care for three months, making various alterations in the machinery. The principal object was to increase the power of the engine for generating steam. The engine had been made three years, but was only worked at intervals on experimental trips, as already stated. He tried the power of the engine after he had made the alterations at a pressure of from 55lb. to 60lb. to the circular inch. He was so satisfied with the state of the engine that he requested a man should be sent to look at it before it was put on the line, as he understood the Birmingham and Gloucester Company were to purchase it if they approved of it. A man was accordingly sent to inspect it; his report was favorable, and the engine was put on the line on Monday last. In filling the boiler with water from the hose at which the engines are supplied, the witness said he remarked to those around him that the water was not fit to use in the engine, that it was too sandy for such a purpose, and that it would destroy any engine. They then got the steam up, screwing the safety-valve down to about 44lb. to the inch, as indicated by the gauge, and ran the engine on the line. It worked, as he considered, very well. Next morning the engine was again prepared for work, but in endeavoring to let the water that remained in the boiler off by means of the tap underneath, they found it would not run, but merely kept dropping. He freed the tube of the tap with a bit of stick, when the water came more freely, with a great quantity of sand. After clearing the engine, Mr. Cruze, the engineer of locomotives on the line, came up to him, and said, he believed it would answer, but wished them to get the steam up for another trial. The engine was accordingly prepared and tried on some short curves on the line, on which the engine was moved slowly, while Rutherford, the fireman of the locomotives, and Scafe, a driver on the railway, watched the manner in which the wheels fell on the rails, and they were found to work in the most satisfactory manner. They then returned, and prepared to make a start up the incline. They examined the engine carefully, Rutherford expressing himself much pleased with the excellent manner in which it worked, his observation being that he had never been on such an engine in his life. At this time the boiler was three parts filled with water, as they ascertained by the gauge; the safety-valve with the indicator was at 44½lb., and the additional valve at 40lb., the latter blowing a little steam, which was scarcely powerful enough to raise the other valve. Scafe then went into the fire-hole to rake the fire, and witness was standing by the starting gear, the place set apart for the conductor. Rutherford was close by him, and there was also on the engine at the time a man named Jennings, as well as his own assistant, when the explosion took place. The contents of the boiler were blown through the tubes and fire-hole, lifting witness clean off the engine with his companions. Scafe being forced out at the door of the fire-hole, and Rutherford being flung to a distance of 50 or 60 yards. Scafe was quite dead when taken up, and Rutherford died on the following morning. As soon as witness recovered his senses, after inquiring as to the fate of his companions, he asked some one to examine the valve and see what it was screwed down to, when it was found to be 44½. [Mr. George Bishop, an engineer on the line, here said he was one of those who examined the valve, and he found it screwed down to 45, as nearly as he could observe by the light which he had.] Witness had since examined the engine and found that the accident had been occasioned by the bursting of one of the plates of the inner tube of the boiler, a rent being made in it of about two feet long by one foot wide. At the time the accident occurred, the engine was standing perfectly still. The boiler was about three-eighths of an inch thick, which he was enabled to speak to from having had occasion to drill holes through it, but he should not imagine that the thickness of the plate which burst exceeded a quarter of an inch.

In reply to questions by the Coroner, as to what was the general thickness of boilers, the witness said he had seen boilers at three-fourths, five-sixteenths, and seven-eighths of an inch in thickness. There was no usual thickness, the construction depending on the opinion of the engineers, some of them contending that it was better to have thin metal, if it was good. The construction of the boiler and the quality of the iron were, in his opinion, the chief points. The average pressure at which high-pressure engines were used was about 50lb. or 60lb. to the square inch, but he believed a good boiler would be in no danger at 70lb. pressure to the circular inch. Much, however, depended on the principle of the boiler. There was nothing in the construction of the boiler in question to weaken it, or affect its safety.

Coroner.—What, in your opinion, was the cause of the accident?

Witness—It strikes me that the quantity of sand in the water settled on that part of the plate which gave way, and kept the water from the iron, which got red hot, and the plate, being lighter than any other part of the boiler that they could see at present, gave way through the pressure upon it, and also through its being made of bad iron. The iron, he considered, was as bad as he had ever seen. There were several plugs, screws, and pieces of iron found in the boiler after the explosion, which must have been left there by the workman who fixed the taps, and which helped, in his opinion, to solidify the sand over the plate. There was no sand found in the boiler, but he imagined that it was blown out at the time of the accident, the heavy bits of wood and iron that remained being forced back, probably, by the seams or other parts of the boiler with which they came in contact.

Mr. Bishop, an engineer in the employment of the company, had examined the rent in the boiler, and attributed it altogether to the thinness of the plate. It was quite absurd to imagine that the small accumulation of sediment produced in two days' working could have acted in the manner described by the last witness. He did not consider the iron bad. It was not of the best kind. The whole blame rested, in his opinion, with the boiler-maker.

Mr. B. Wakefield, engineer and machinist, residing in Birmingham, said he was engaged by Dr. Church, to superintend part of the construction of the engine. The boiler had been made by Mr. Horton, of West Bromwich, and was ordered of three-eighths thickness. When sent home it was proved at the manufactory, at a powerful pressure of three times, at least, as great as ever it would require to be worked at. It sustained a pressure, on the trial in question, of 100lb. to the square inch. He never knew any one to express a doubt as to the safety of the boiler or engine. When it was ordered he made a sketch of it, but he did not recollect that any particular directions were given respecting the plates. The trade of a boiler-maker is quite distinct from that of a manufacturer of engines.

The inquest was adjourned till the following day. Evidence was then given as to the thickness of different parts of the boiler plates. The plate that burst was found to be three-sixteenths of an inch thick, and other parts were five-sixteenths. Dr. Church was examined. He said he ordered the boiler to be made by Mr. Joshua Horton, of Brierley-hill, and that the instructions he thought he gave were to have the plate that burst made three-eighths of an inch thick, as that he conceived required to be stronger than any other part: the outer tube he

ordered to be made of less thickness. He thought the boiler in question was proved to a pressure of 150lb. to the circular inch. The engine, he said, was sent when complete to the London and Birmingham Railway. It was tried experimentally for several days upon that line. It became necessary to make alterations in it, and it was afterwards removed to the Grand Junction station. It was at first tried experimentally, and subsequently attached to a long train of wagons laden with coke, with which it ascended the inclined plane near Wolverhampton, and came to Birmingham. It was afterwards, in consequence of breaking an axle, removed from the Grand Junction line. Some alterations were afterwards made in it. The alterations made by Mr. Inshaw would not affect the security of the boiler.

The Coroner, at the conclusion of Dr. Church's examination, observed, that a great responsibility was thrown upon the boiler-maker, inasmuch as Dr. Church had stated that the plate of the boiler which had burst was only half the thickness he had ordered it, and was in a position so as to render it very difficult to ascertain its thickness, while the plates which could be examined with facility were of the thickness ordered. In justice, therefore, to Mr. Horton, as well as to the public, he should adjourn the inquiry until Monday, the 23d, to enable him to obtain Mr. Horton's attendance, and give abundant time for a more minute examination of the engine.

ACCIDENT ON THE SOUTH WESTERN.—On Tuesday evening, about 8 o'clock, Thomas Williams, timekeeper, under Mr. Walter, at the Woking station, was run over by one of the engines on the line, and so seriously hurt, that he died on Wednesday morning. It appears that one of the engines was returning to the Woking station for a supply of water after leaving the train, when Williams, who was on his return home from work, and who, it is thought, supposed the engine was on the other line, was knocked down. The engine passed over him, crushing his right arm in so dreadful a manner as nearly to tear it from its socket.

FOREIGN RAILWAYS.

The states of Gallicia have appointed a commission to direct the works of the railroad, which will extend from Lembery to Brody. Prince Leon Lapicha is the president of this commission. The preparatory works are about to commence, the expenses will be defrayed from the public treasury. The expenses of the construction are estimated at 8,000,000 florins. It is intended to call the new railroad Ferdinand-d'Este.

THE RAILWAYS IN ALSACE.

The *Industriel Alsacien*, published at Mulhausen, the principal seat of the cotton manufactures of France, gives the following enlivening account of the opening of a fresh extension of the railways in Alsace, which took place at the close of last month. These public undertakings are honored in France by the patronage and presence of the civil and military authorities. It would be deemed extraordinary in England for files of soldiers to be drawn out to salute the railway trains on the opening of a new line; but on the Continent there is more respect paid by the public functionaries to these great national undertakings. The branch of railway, the opening of which is described in such glowing colors by the *Alsacien*, was from Mulhausen to St. Louis, which forms a portion of the road between Strasburgh and Bale.

"Towards the end of last year, on the 1st of September, we celebrated the opening of the first line of railroad in Alsace, that of Mulhausen to Thunn. On the 18th of October, 1840, the town of Colmar inaugurated, in a distinguished manner, that section of the great line from Strasburgh to Basle, and in eight days afterwards the division from Mulhausen to St. Louis was opened on the same road. Thus, in less than fourteen months, three divisions of Alsacian railroads have been thrown open to the public; and towards the middle of the next year, the whole extent of our beautiful and enterprising province will be intersected by railroads; which by accelerating the communication from town to town, from village to village, will revive our agriculture, our commerce, and our manufacturing establishments.

"It was last Sunday, the 25th of October, 1840, that the first train was run on the division between Mulhausen and St. Louis. This train, propelled by the steam-engine the *Town of Basle*, and adorned with national colors, consisted of a berlin, of three diligences, and two chars-a-bancs, in which were placed the persons invited by the directors, amounting to about a hundred and fifty. Many ladies had accepted this invitation.

"The fine steam-engine, the *Town of Basle*, which propelled this train, is of Alsacian manufacture. It, as well as the *Napoleon*, and many other excellent locomotive engines, were manufactured by Messrs. Andrew Koechlin and Co. This establishment has already furnished six steam-engines to the railroads at Alsace; four others are now making, and all those hitherto used, as well as the great number of handsome travelling carriages which have come from the same manufactory, do great credit to the ability of the engineers.

"In a short time the train reached the hill of Rixheim, where the first station is established. A crowd of spectators had arrived at this place, near a green triumphal arch, the size of which had not however been considered with a view to the passing of the engine, the chimney of which touched the top of it. In the midst of the report of musketry and petards, the triumphal arch was dragged to the ground, and fell upon the engineers, who were for the moment stunned. This incident was scarcely remarked by the travellers; and it was only from the engineers being obliged to stop the train to disencumber the engine from the green branches which impeded its progress, that they knew of the accident. The journey was accomplished with regular speed as far as Habsheim, another station. There, also, a green triumphal arch had been erected; but in this instance the proportions were better observed, and the train cleared it without difficulty, in the midst of the joyful acclamations of the inhabitants of the village, who testified their feelings by the firing of guns, petards, &c.

"On the first approach to the frontier, the French, Swiss, and Vaudois, uniting in sentiments of curiosity, astonishment, and joy, presented, from the great variety of their costumes, a most striking *coup d'œil*.

"The large and handsome station of St. Louis, where the buildings are as elegant as they are substantial, displaying the national colors, announced the end of the journey. At length, after having been thirty-four minutes, stoppages deducted, in passing over the distance which separates Mulhausen from St. Louis (28 kil., or 7 leagues) the travellers arrived at the last French station. At the entrance of the city of St. Louis, the national guard were ranged under arms near a triumphal arch, on one side of which was the inscription, *Honor to the Directors of the Railroad*, and on the other *Thanks from the Inhabitants of St. Louis.* The train advanced majestically through a file of dragoons and custom-house officers under arms, hailed by the sound of drums, of music, the report of musketry and cannon. The immense archway under which it stopped was ornamented with garlands and festoons. One of the quays had been converted into a gallery decorated with tri-colored draperies, extending the whole length of the building. This gallery was filled with an innumerable quantity of spectators—a place was reserved for the musicians of the 11th regiment of dragoons,—the air resounded with their music, mingled with the acclamations of the joyous and astonished people." The authorities of the town came in procession, and invited the directors to a public dinner, at which toasts were drank and speeches made in the English fashion.

RAILWAY LITIGATION.

In the Bail Court on Monday, Sir Frederick Pollock applied for a rule, calling upon the directors of the Grand Junction Railway to show cause why a writ of mandamus should not issue, commanding them to comply with the provisions of the Act of Parliament, 3 Victoria, c. 49, sec. 26, which enacts, "that the charges by the said Acts authorised to be made for the carriage of goods, passengers, &c., to be conveyed by the said company, shall be at all times charged equally and after the same rate per mile, or per ton per mile, in respect of all passengers and goods on carriages of a like description conveyed or propelled by a like carriage or engine, passing on the same portion of the line only, and under the same circumstances; and no reduction or advance in any charge for conveyance by the said company, or for the use of any locomotive power to be supplied by them, shall be made, either directly or indirectly, in favour of, or against, any particular company or person travelling upon or using the same portion of the said railway under the circumstances as aforesaid." The Learned Counsel said the object of the present application was to try the question whether the directors of the Grand Junction Railway Company had a right by any arrangement which they might privately enter into to contravene the Act of Parliament which he had just read, and in substance to exclude Messrs. Pickford and Co., the carriers, from carrying on their business. It would appear from the affidavits on which he founded his motion that the directors of the Grand Junction Railway Company had openly avowed, "that their object was to drive all carriers from the railway—that the company were carriers themselves, and no other carriers were wanted." Every Railway Act contained a clause apparently compelling the directors to permit any persons to have their own locomotive engines, carriages, &c., placed on the railroad, if they thought proper. But as locomotive engines must stop somewhere to obtain, as often as might be necessary, a fresh supply of water, coals, &c., and as the clauses in the Railway Acts to which he had alluded contained no provision for compelling the directors to supply coals, water, &c., on the line, they were a perfect dead letter. The directors of the Grand Junction Railway allowed the gratuitous use of a certain portion of their line to Messrs. Horne and Chaplin, the carriers, but refused to allow Messrs. Pickford and Co, to send goods by that line, unless they paid a certain sum of money, which amounted to an additional expense of about £5 per day. Another ground of complaint was that the company conveyed Horne and Chaplin's goods from Liverpool to London for 65s. per ton, but made them an allowance of ten per cent. for calling for the goods at Camden-town, and from thence conveying them to various parts of London, which allowance they refused to make to Messrs. Pickford and Co. Mr. Justice Patteson granted a rule to show cause.

In the Court of Common Pleas, on Wednesday, a rule for a new trial was applied for in the case of Barrett *v.* the Darlington and Stockton Railway Company. This case came before the Court upon a special verdict, finding all the facts. It appeared that the plaintiff is the proprietor of the Gordon Colliery, Durham, and that he had used a branch of the Darlington and Stockton Railway, for the purpose of conveying coals to the port of Stockton, thence to be shipped for London. The company claimed toll at the rate of 4d. per mile per ton for the coals so conveyed; and the plaintiff having paid the amount claimed, sought in the present action to recover all that he had paid over and above the sum which would be produced by a toll of ½d. per ton per mile, that being the rate of toll which, as he contended, the company was entitled to levy upon coals for exportation. The counsel for the company contended that the halfpenny mentioned in the Act was intended as an addition to the toll of 4d. to be paid on coals exported. The argument turned entirely upon the construction of the company's Act, and was not concluded at the rising of the Court.

EEGINEERS OF THE ROYAL NAVY.—The Lords of the Admiraltyhave directed, that the engineer's apprentices shall wear a "uniform," consisting of a round jacket of blue cloth, with stand-up collar, single-breasted, with "regulation" buttons. When the importance of such a powerful auxiliary to motion as steam became obvious, in the infancy of the establishment of a department of this nature by Government, it was found necessary to employ civilians, who proved intractable to naval discipline, and the consequent subordination absolutely essential to be observed for the good of the service, particularly as the pay then exceeded, and now nearly equals, that of the officer in command of the vessel; and at present, when within tropics, the pay of a chief engineer is superior to that of a lieutenant R. N. commanding. It became then the policy of the Admiralty to take "apprentices" regularly "indentured" to bring youths up in the service; but many lads of bad character having been found difficult to be got rid of, in consequence of the legal document, the naval authorities were directed not to pursue the plan any further, and the term "boys" was applied, in a recent Admiralty order, to the apprentices, and we would now suggest, as the Lords Commissioners have declared it necessary to order a uniform for the respectable youths now admitted (many being the sons of gallant and distinguished commissioned naval officers), it would render the matter complete, to designate them "Engineer's Assistants," according to the usage observed towards other candidates for another grade of warrant-officers of a superior rank. The early progress of the steam service of the Royal Navy will be interesting to the future historian, and we ought not to leave it incomplete. At the same time, we cannot approve of that miserable economy by which the Admiralty is actuated in their order, for the sum of sixpence a day to be deducted from the contingent allowance of the chief engineer, for the instruction of the "boys," which is to be added to the pay of the second class boy, now allowed to attend on the engine-room mess.—*Kentish Mercury.*

GENERAL COMMISSION AND PATENT AGENCY FOR IRELAND.

WE beg to recommend our AGENT for IRELAND, Mr. RICHARD TELFORD, 109, STEPHEN'S GREEN, DUBLIN, as the most eligible person whom PATENTEES can employ for the sale of their articles in Ireland. He has a most extensive and respectable connection, and his house is well known as a depôt for patent goods, inventions, &c. We have no doubt of his efficiency to promote the interest of those parties who may favor him with their business.

Mr. TELFORD also undertakes every description of Patent Agency business for Ireland.

TO CORRESPONDENTS.

GRATUITOUS COPIES *of our Journal have been forwarded to a number of Individuals interested in some Patent or Invention, of which notice has been taken in our number of to-day.*

"THE INVENTORS' ADVOCATE" *is published every* SATURDAY MORNING, *at* 7 O'CLOCK; and is regularly issued in MONTHLY PARTS, of which 1 *to* 17 ARE NOW READY.

"THE INVENTORS' ADVOCATE" is also published in Volumes containing the Nos. of every 6 months.

Vols. 1 and 2, handsomely bound, are already published.

TO CAPITALISTS, MANUFACTURERS, AND TRADERS.

Among many VALUABLE INVENTIONS *and* PATENTS *registered at the* PATENT OFFICE, BRITISH and FOREIGN, (198, STRAND), *for the investment of capital, Shares are offered for sale in the following Useful Inventions:—*

A Fire Escape of Novel Construction, which may be used as an Observatory.

A Cheap Lamp for burning Tallow and Grease, without overflow or smell.

Patent Screw Jack, for lifting locomolives and other great weights.

An Improved Balance, applicable to small or great weights.

Important Improvement in Wood Paving.

A New and Improved Method of Burning Coke.

New Methods of Purifying and Treating Oils.

A new System of Clock-making.

Patent Forge Back.

A new Castor for Furniture.

Patent Process for the Manufacture of Soda.

Improved Methods of Building Iron Ships.

The Purification of Gas.

Improvements in Soap-making.

An Umbrella, in imitation of a Malacca Cane.

TO INVENTORS.

PERSONS WHO WISH TO OBTAIN OR DISPOSE OF PATENTS, *or to bring* NEW INVENTIONS INTO USE, *are requested to apply to the* PATENT OFFICE, BRITISH and FOREIGN, No. 198, STRAND, *opposite St. Clement's Church, where they will meet with great facilities to obtain information and to carry out their views.*

THE GALLERY OF INVENTIONS,

Attached to the Patent Office, is a spacious Saloon, well lighted, in which Plans and Models are exhibited. It affords an excellent medium for bringing New Inventions into public notice.

THE INVENTORS' ADVOCATE, AND JOURNAL OF INDUSTRY.

SATURDAY, NOVEMBER 21, 1840.

*** *The Office for the publication of* THE INVENTORS' ADVOCATE, *is removed from Tavistock Street, Covent Garden, to the Patent Office, British and Foreign,* 198, *Strand; opposite St. Clement's Church.*

In the mode of conducting our Journal, we always keep in view the character we have assumed of the "INVENTORS' ADVOCATE" and Friend. It has been, and is, our constant aim to reconcile our duty to the Public, and to Inventors as a body, and to show that, on an enlarged view of the public welfare, their interests are the same. With reference to the Publication of Specifications, we have often been placed in a painful position; but we have, in the midst of clamor and abuse, pursued our course in one undeviating line; and on no occasion have we shown partiality.

We consider the early publication of specifications as a measure of the highest utility to inventors as well as to the public; and that it is calculated to bring about a reform in the patent laws. We must, however, admit that such publication although good in principle and useful to the public, has, in some few cases, been a hardship to individuals, from the insufficiency of the notice given to them. We are anxious, therefore, to remove, this ground of complaint.

We announced in a former number, that we had taken measures to give notice to every patentee, *one month* before the intended publication of his specification; that time being amply sufficient, if due diligence be used, to secure the patents abroad. There are, however, cases, when the description of an invention is complicated and accompanied by many drawings, in which a month, allowing for the preliminary negotiations and arrangements which are sometimes necessary, is not sufficient. In consideration of these circumstances, we have determined to extend the notice to *two months*; and to give it in a form which will fully explain to every patentee its object and intention, so as to leave him ample time and opportunity to take out his foreign patents. We give in another part of our present number the form of this notice; to which we refer our readers. We have before stated our opinion that foreign patents might, with perfect safety to the English patent, be secured immediately after the latter is sealed. Inventors can in every case, by applying at our office, be confidentially advised respecting the course of proceeding.

We now consider this question of the publication of Specifications in the "INVENTORS' ADVOCATE," as set at rest, and shall not again revert to the subject unless we are openly attacked. To private anonymous communications we shall not consider ourselves bound to make any answer.

We have this week recorded, in other parts of our journal, the particulars of four fearful accidents on railroads; three of them being collisions, and the other the explosion of a boiler. The occurrence of these calamities so shortly following others of the same kind, leaves no doubt that as the railway system extends, the number of accidents increases in still greater ratio. This fact, if unexplained, would tell against the system of railway communication altogether, as necessarily being more dangerous, and exposing passengers to greater risks, than stage-coach travelling. An opinion of this kind has been gaining ground, owing to the severe attacks by several public journals on the improper management of railways, which, in many minds, is connected with the system of railway communication itself.

It is, indeed, especially incumbent on the directors of railways, even for the protection of their own interests, independently of all public considerations, to use their utmost endeavors to avoid the dangers which are peculiar to this new and expeditious mode of conveyance; and those are the best friends to the railway system who continue to urge the necessity of adopting further precautions.

Two of the instances of collision we have this week noticed, arose from gross want of care on the part of the engine-drivers. In neither case does there seem to be the least excuse for their wanton neglect of duty. Neither darkness nor fog concealed from sight the trains against which they rushed headlong. On the Eastern Counties Railway the accident took place in broad day-light, with the train in full view, at least six hundred yards before the collision. On the London and Birmingham the driver of the second engine, though signaled to stop and warned by the shutting off the steam of his leader, was regardless of either warning, and forfeited his life as the penalty of his neglect.

Every one of these accidents, it is evident, might have been prevented with the exercise of ordinary care. The incompetence of the men now employed as engine-drivers for the very responsible duties they have to fulfil, becomes more and more apparent as their conduct is submitted to scrutiny. The increasing demand for such men, owing to the rapid extension of railway communication, is one great cause why persons so unfitted for the office are appointed.

The very few properly qualified, who will undertake the duties of an office which ranks so low,

necessarily obliges the managers of railways to engage men whom, if they had a choice, they would rather not employ. This, again, tends to perpetuate the evil. The low standing of this class of men prevents others of a higher grade from devoting their attention to the employment. It came out at the coroner's inquest on the men killed near Harrow, that the engine-driver of the wagon train, who had been in that occupation for seven years, is unable to write or read, and that this is far from being a solitary instance of the kind. Whilst such persons are continued in the employment, men of education and of respectable standing in society, will consider themselves degraded to take an office which would place them on a level with those who are so utterly destitute of the first rudiments of education.

The plan that we have before proposed would afford a speedy and effectual remedy for the present lamentable deficiency in skill and conduct of the engine-drivers. If the trains were placed under the command of a captain, a man of respectability and experience, whose previous character was a guarantee for his attention to his duties, the character of the men who acted under his orders would be of comparatively little consequence. The duties of the captain might be easily learned, as the chief requisites would be constant attention and prudence. On him would devolve the responsibility of giving orders to the breaksmen and engineer, and as his attention would be devoted solely to guard against approaching dangers, there would be fewer chances of their escaping observation, and his command over the subordinate officers would keep them to their duty. An appointment of this kind would, indeed, entail some additional expense on the management; but that ought to be a matter of no consideration when the prevention of accidents is the question. Sure we are, that it is a most ill-judged economy that effects a saving at the risk of accident.

We hope there exists too liberal a spirit among the directors of most of the railways in the kingdom to make expense an object, if they clearly saw that probability of risk would be diminished. The great fault they seem to have committed has been in placing too low an estimate on the important duties of engineer. They have been misled into the opinion that as no guidance of the trains was required, and as attention to signals and keeping a proper look-out were the principal duties required, men of very inferior station were capable of discharging them. Experience has fatally proved their error, and we trust that they will hasten to remedy it by adopting the plan we propose, or some other that may place the conduct of the trains under more trustworthy control.

NEW INVENTIONS.

ELECTRO-MAGNETIC LOCOMOTIVES.

At a recent meeting of the Society of Arts and Manufactures at Mulhausen, D. Perrot read the translation of a note, written in German, and addressed to the society by M. Vogil, of Frankfort, giving an account of a rotary magnetic electrical apparatus, invented by M. J. P. Wagner; an apparatus which has already engaged the attention of many learned societies in Germany. In this note M. Wagner states that the electro-magnetic machines already known, among others that of Jacobi of St. Petersburgh, are quite unconnected with his own, all the advantages of which he points out. It must be observed however that as yet these advantages remain to be proved by their application in practice. This machine, M. Wagner says, is remarkably well adapted for locomotives, for the following reasons:—The greatest possible degree of quickness can be produced;—the consumption of the machine is in inverse proportion to the quickness produced, that is to say, the faster it advances the less it consumes, which with respect to locomotives is quite the contrary;—it never requires time to stop for supplies of coal and water, as other locomotives do;—the motion in its most rapid action is immediately communicated;—and, lastly, these machines being very light, compared with locomotive steam-engines, travellers may remain above the machine and on the same carriage and without any danger. In short, the note goes on to say: this machine will be very suitable for steam-vessels,—firstly, from the reasons already stated with respect to locomotives;—secondly, because only very few supplies to keep it in action would be required for long voyages, and there is never any risk of explosion.

NEW FLOATING FIRE-ENGINE.

A powerful floating fire-engine is now constructing by Mr. Merryweather, Engineer, Long-acre, (from a design by Mr. Baddeley) for the Emperor of Russia. This engine will consist of three seven-inch cylinders working into a capacious air-vessel, from the top of which rises the discharging main. It is to be placed in an iron boat, now building by Messrs. Fairbairn and Co. The engine is situated in the centre of the vessel, and worked by four cranked handles each twelve feet long, two being placed before, and two abaft the engine. From 50 to 60 men can be put on to these handles; when the engine will deliver a column of water $1\frac{1}{4}$-inch in diameter at the height of 130 or 140 feet.

The most striking difference between this engine, and the floating engines employed by the London Insurance Companies, consists in the adoption of an improved mode of propulsion. The latter are impelled by long oars, which take up a good deal of time in getting out, lowering the thwarts, placing the men, &c., and are very ineffective for the purpose, from the impossibility of getting together a sufficient number of skilful hands on a sudden alarm of fire. When "under weigh," therefore, and proceeding to a fire, they invariably "drag their slow length along." On reaching the fire much time is again lost, the oars have to be unshipped and stowed away in their proper places, the hatches replaced, the engine handles unlocked, opened out and made fast; the hose has then to be got out and affixed to the engine, &c. In Mr. Merryweather's improved engine, a pair of paddle wheels are placed at the sides of the boat, and the two foremost handles made to unship, so as to be thrown into gear with either the engine or the paddle shaft, and are thus promptly available for either purpose. By this simple expedient no loss of time is incurred. In case of fire about twenty able-bodied men being got on board, the handles are geared with the paddle wheels, the men commence working, and the boat moved rapidly towards the seat of danger. In this case bodily strength only is required, and this can usually be obtained in abundance, when *skilled labour* is wholly unattainable.

On reaching the fire, the boat is steered into a suitable berth and stopped, the handles are disconnected from the paddle-shaft and thrown into gear with the engine. Working instantly commences, (the hose, &c., having been attached during the journey,) and within one minute a splendid jet of water is pouring on the burning mass. In travelling a distance of two miles or more, such an engine would beat those of the present construction, by more than half an hour in the time of being brought to bear upon the fire. When it is considered that *timely application* is of far greater moment in these cases, than even a more powerful agent brought up at a later period, we cannot help thinking that the insurance companies have acted unwisely in not availing themselves of the advantages of Mr. Baddeley's contrivance, which, next to *steam*, is the best that can be employed for this purpose. There is also a decided superiority in the working of these rotary engines, over those of the alternating kind; the relative uniformity of motion in all the working parts is highly favorable to the development of the utmost powers of hydraulic or pneumatic machinery of this description. The supineness or slowness of apprehension on the part of the English, forms a striking contrast to the conduct of foreigners, who are generally quicksighted and *unprejudiced* enough promptly to avail themselves of our most ingenious inventions and our greatest improvements in all kinds of machinery. Mr. Braithwaite's splendid steam fire-engine "the Comet," was built for Prussia—and the finest floating engine ever constructed in this country is now preparing for Russia.

NEW MODE OF BRIDGE-BUILDING.

The enlargement of the bridge on the canal of St. Denis, on the road from St. Owen, is about to be effected according to the new plan invented by M. Neville. The council-general of the Seine has commenced the application of this mode of bridge-building, which is altogether new, and is thought by those who are favorable to the plan to be likely to be attended with important consequences. The advantages of these bridges, it is said, are, that they will not be washed away by sudden inundations, like most of the bridges built over streams liable to be flooded. The bridges planned by M. Neville are composed of rafters of wrought and cast iron, the size of each of which is from twenty-five to thirty metres. Four of these rafters are fastened two together at a distance of fifty centimetres. They are afterwards placed in such a way as to form a scaffolding. The platform is placed in the middle and below those two pairs of rafters, the uppers part of which form the parapet The extremities of the rafters rest upon supports which require no other foundations than those which can resist a weight acting vertically. The rafters are horizontal and have no lateral action. For the construction of a bridge two hundred metres long there would only be required seven piles, or piers, two metres at the base, and at the top one metre. The only obstacles that a current of water would meet with would be these piles, between which there would be an opening of thirty metres, and if the waters were to rise as high as the parapets, the only actual resistance to their passage would be the thickness of the platform.

IMPROVED PRINTING PRESS.

M. Lenormand, a celebrated mechanic, has discovered the means of printing on one cylinder both sides of the same sheet, which enables his mechanical press to act with a quickness double any hitherto known, and can produce 4,000 copies in an hour.—*Moniteur Industriel.*

NEW DISCOVERY IN LITHOGRAPHY.

A report has reached us of an extraordinary discovery, by M. Hullmandel, who had already done much to improve lithography, of a new mode of producing pictorial effects on lithographic stone by tints washed with a brush, like sepia drawing, which yields impressions so perfectly resembling original sketches that the difference is not discernible. The painters, we are told, will now have at their command a means of multiplying their own works, which their habitual practice renders available, without altering their style of handling; for this new mode of lithography, or, rather, painting on stone, is just the same as if the sketch was made on stone instead of on paper. The variety and delicacy of the tints, the freedom and facility with which they are produced, and modified as well, and their durability under the printing process, are among the advantages attributed to this discovery. —*Athenæum.*

PATENT WIRE ROPE FOR STANDING RIGGING.

Last week a series of trials of Smith's Patent Wire Rope was made at the Corporation Testing-machine,

in Trentham-street, Liverpool, in presence of a number of nautical gentlemen and others interested in improvements in navigation, and the result was highly satisfactory. The patent consists of improved methods of forming a rope from any number of wires that shall be flexible, is served with hemp, and can also be spliced or knotted. The rope is in the usual way, so as to exclude the water; and a chemical preparation is employed to prevent oxidation. The rigging with wire rope is smaller and lighter than of hempen rope, and as it offers much less resistance to the wind, is of great advantage in beating to windward. The cost too is much less, and the durability greater. In the trials we have alluded to, the following results were ascertained:—

1-inch rope broke at 2 tons 1 cwt.			
1½	..	5 .. 0 ..	
2⅜	..	8 .. 14 ..	

Other sizes were also tried with proportionate success; and it should be remarked, that a *three inch* hempen rope of the best quality broke at 2 tons 1 cwt. The weight or traction borne by each piece of different sized rope far exceeded that fixed in the scale of the patentee, thus showing great superiority in the workmanship of the manufacturers, Messrs. Fox and Co., of London and Birmingham. According to the scale alluded to, the weight to be sustained by 1½-inch wire rope is 3 tons 10 cwt., and so on in proportion. Another good quality of the wire rope is its elasticity, which, though not of course equal to that of hemp rope, is quite sufficient to counteract the effects of a sudden jerk while a vessel is rolling heavily at sea. One comparatively short length of rope that was tried, stretched 18½-inches before it broke. A very short length of 1½-inch stretched 6 inches. The machine on which the tests were made is very ingenious, and of tremendous multiplying power; it is that on which iron cables for the largest ships are put to their utmost tension of many tons. The gentlemen present took a deep interest in the operations, and were at once gratified and astonished to witness the immense weight or traction sustained by lengths of wire rope so comparatively small and light.—*Liverpool Standard.*

IMPROVED HOT-AIR STOVE.

The *Midland Counties Herald* has the following notice of improvements made in Mr. Gilroy's hot-air stove. In December last we noticed a new hot-air stove, patented by Mr. Gilroy, of Birmingham. Since that time, we understand that the patentee has made some very valuable improvements in this useful article, by which its durability, economy, and adaptation to the purposes for which it is intended has been greatly increased. The following are among the chief improvements which the stove has undergone. Its general appearance has been greatly altered, and the top may be entirely removed in order to supply the fuel, of which it is capable of holding sufficient (proper attention being paid to the regulator) to last from twenty-four to thirty-six hours. The inner cylinder, which was made of sheet iron, has been replaced by one formed of fire-brick, thus increasing its cheapness and durability and adding to the heat of the stove itself; the inner part of the stove is portable, and may be removed; sifted embers from a common grate will burn equally well with coke; and the usual cost of the fire in the stove is calculated at from one half-penny to a penny per day. In addition to these advantages, the stove is found to act equally well, whether the piping be carried upwards through the chimney, or through the floor beneath, the noxious vapor being effectually prevented, by a very simple contrivance, from communicating with the air of the apartment.

CRYSTALLISATION OF ZINCED IRON.

Sheet iron galvanised or zinced, that is, to speak more intelligibly, iron plates *tinned* with *zinc*, are as capable as tinned iron plates of assuming on its surface by means of the action of certain acids that crystalline brilliancy which produces so beautiful an effect, and which is known by the name of "moirage.' The following is the plan adopted by M. Bor, chemist, for accomplishing this. The iron plate is boiled in a liquid of concentrated lime, which gives it a tarnished appearance. In order to restore its brightness and to produce on it the effect desired, it is removed thence into water very slightly acidulated with muriatic acid. It is then washed in common water, and dried with care. It has then only to be covered with varnish to preserve its appearance and brightness. This process is less insalubrious than the one pointed out by M. Alard, for crystallising tin, and it is more economical.

LECTURES ON THE COMBUSTION OF COAL AND PREVENTION OF SMOKE.

Charles Wye Williams, Esq., of Dublin, is delivering a course of lectures at the Liverpool Literary and Scientific Institution, St. Anne-street, on his plan for effecting perfect combustion. The first lecture introductory to the subject was given on Friday the 6th inst., and was numerously attended by engineers, manufacturers, and professional gentlemen.

Having briefly stated the object of these lectures, the lecturer proceeded to take a view of the present system of combustion on the scale of the furnace. He quoted authorities to show that no accurate data exist for regulating the relative proportions between boilers, and furnaces, and fuel. From his connection with steam navigation, he said he could state, that when a boiler is put either into an old or a new vessel, no one can tell whether it will be a "glutton" or not. The engineer cannot guarantee either the quantity of heat or of fuel. Ever since Watts's patent of 1785 practical men are in error, because they have gone on a wrong track. In considering the consumption of coal, we must learn its chemical constituents, and we have, therefore, first to ascertain what coal is. The chemist divides coal into bituminous and carbonaceous. To show the properties of coal when heat is applied, Mr. Williams, by means of a blow-pipe, directed the flame on a piece of coal. At the end of the jet of flame it gave out abundant smoke without flame. Here, he observed, all the heat goes to evolve the gas, and so in the gas-works the heat applied outside the retort generates the gas within. On approaching the coal within the jet of flame, as he showed, the gas then takes fire, and when once ignited affords heat enough to keep up the combustion. We have first, then, to expel the gas, which the resinous part of the coal affords, and next we obtain what we call coke. In treating of the generation of gas he very ingeniously illustrated its analogy to the generation of steam. He also spoke of the cooling effect of gasification, and its effects in the furnace. In the furnace we have to keep up a double combustion. The chemist, if asked how we could burn a gas and a solid, would think us insane, yet it is on this system we proceed; we put in the coal, allow a large draught, and by this most unmechanical, unscientific process expect to effect a perfect combustion. We should rather try to provide for the combustion of these two bodies, the coal gas and carbon, called coke. After we have got the gas and solid matter, let us see what has to be done. The chemist will take a measured quantity of the gas, a certain measure of hydrogen and oxygen, and ignite them. But in the furnace we allow the gas to escape into the flue, where, as it cannot be rendered available, it is lost. Mr. W. next treated on combustibles, and supporters of combustion. Then by means of a large diagram he explained the atomic proportions of the gases produced and those we have to burn in the furnace. Carburetted hydrogen is the gas of which the largest quantity is evolved. He also went into the inquiry respecting the quantity of atmospheric air that is requisite to effect the combustion of this gas to afford the greatest quantities of heat; proving the absolute necessity of attending to this neglected point. Here on the large scale we never take into account the quantity of air; we have a large draught, and then think we are doing the best thing that can possibly be effected. He then came to the inquiry, What is combustion? This can be readily explained. When we bring together a combustible and a supporter of combustion, the moment they come into contact they combine, and their bulk, form, and electrical state are changed. This he explained to be dependent on electro-chemical action. Thus we ascertain, and the researches of Dr. Faraday have confirmed the fact, that oxygen is always in a negative, and hydrogen in a positive state of electricity. He read a passage from a work by Dr. Dalton, of Manchester, to whom he paid a high and just compliment for the services he has rendered chemical science, confirmatory of the value of his atomic theory, by which chemistry is reduced to weights and measures, so that we can proceed in our investigations without uncertainty. He also quoted Berzelius as another eminent authority on this head. Having thus considered the question scientifically and practically, he proceeded to consider the difference between combustion in the laboratory and that carried on in the furnace.

We find the constituents of water to be two atoms of hydrogen to one of oxygen. The moment the gases in these proportions are ignited by the electric spark in an appropriate vessel, the entire gases disappear, and water only remains. Now the hydrogen forms a large portion of the gaseous matter of coal; therefore, for its combustion we require half its measure of oxygen. The diagram illustrating these facts was very fully and pleasingly explained, and indeed throughout the lecture Mr. Williams was loudly applauded for the happy manner in which he communicated the valuable experience of a long course of experiments, the results of which are extensively applicable. On the nature of chemical equivalents in combining volumes and weights, Mr. Williams was very clear and distinct, and his manner of conveying the desired information on this otherwise abstruse point, was as original as it was excellent for being easily comprehended. From Parke's Reports he showed the erroneous opinions entertained in regard to the subject under consideration: he says, "It is the economy of steam which constitutes the dynamic excellence of steam: the economy of heat is the perfection of the boiler." After showing the fallacy of this statement, Mr. Williams said, "It is the economy of fuel that is the perfection of the furnace." He gave an illustration of the combustion of bodies by reference to the case of gunpowder. Few he had no doubt, apart from his chemical friends, could state what are the *chemical* constituents of gunpowder? They would know of course that it was a *mechanical* combination of nitre, sulphur, and carbon. Here, as he demonstrated by a separate diagram, we have twelve distinct bodies, by atoms, which must be brought together to afford an explosive compound. Mere mixture of the ingredients is not gunpowder; they have to be brought into intimate contact. In firing it, coarse powder deposits soot, whereas in good gunpowder, entering into chemical union, no part is left. The example this body affords teaches us not only the absolute importance of proportions, but also of relative proportions.

The part which air has to act in the process of combustion, was next gone into; the necessity of measuring all that has to do with combustion was evinced by the fact that oxygen and nitrogen in different proportions afford five distinct bodies. In the combustion of a single atom of gas we have 15 bodies, 8 of which are absolutely noxious. A cubic foot of gas requires 10 cubic feet of air, and this was clearly shown by a diagram. He thus showed the quantity of air required for the combustion of the *gas*, and the quantity of air required for the combustion of the *carbon*, or coke, and concluded by estimating the quantity of gas in a given quantity of coal, and its heating power, from which he deduced the possibility of carrying a body of flame through a flue 20 miles, or more in length, evidencing the evil consequences following inattention to these latter considerations. The great skill and ability displayed by the lecturer in this introductory lecture excited the unanimous applause of a numerous and attentive auditory.

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List in arrear concluded from No. 68.

NO. OF DESIGN.	DATE OF DEPOSIT.	NAME OF PROPRIETOR.	SUBJECT OF DESIGN.	DURATION OF COPYRIGHT.
	1840			
396	10 Sept.	Geo. Jackson and Sons	Ornaments for Glass Frames, &c.	1 year.
397	11	Charles Griffin	Kite	1 „
398	11	Alfred Toy	Lamp Chimney	1 „
399	14	Sarah Coote	Fire-hood	3 „
400	14	Ditto	Candlestick	3 „
401	16	Henry Manton	Tops for Castors	3 „
402	17	Andrew Bearne	Boot	1 „
403 to 404	18	Joseph Newcomb and Son	Carpet	1 „
405 to 409	21	Richard Goodlad and Co.	Stained Paper	1 „
410	22	George Pratt	Lamp Chimney	1 „
411 to 419	23	Joseph Newcomb and Son	Carpet	1 „
413	23	Southwell and Co.	Carpet	1 „
414	24	William Blackwell	Curling Comb	3 „
415	24	Joseph Newcomb and Son	Carpet	1 „
416	28	James Yates	Table	3 „
417	28	Ditto	Framework for a Steam Engine	3 „
418	28	John Rodgers and Sons	Contracting Clasp	3 „
419	29	Charles Rowley and Jno. Smeeton	Button	3 „
420	30	James Sinnister	Shoulder Strap	3 „
421	2 October	Charles Goodall and Son	Metal Roller	3 „
422	5	Frederick Harrison	Linen Drill	1 „
423	8	Robert Jones and Son	Corkscrew	3 „
424	8	Henry Barber Elwell	Lantern	3 „
425	8	Ditto	Pocket ditto	3 „
426	12	Watson and Son	Carpet	1 „
427 to 429	13	Ibotson and John Walker	Cantoon	1 „
430	13	George Jackson and Sons	Frame	1 „
431	14	John Ridgway	Machine for Burnishing China, &c.	3 „
432	16	Aspinall and Cross	Grand Drill	1 „
433	19	Colebrookdale Company	Stove	3 „
434	20	Thomas Barber Wright	Dial for Railway Time-tables	3 „
435 to 437	22	John Rostron	Cantoon	1 „
438	23	Rotton and Scholefield	Castors	3 „
439	23	Henry Gardner	Duplex Spectacles	3 „
440	26	William Mosey	Envelope	1 „
441	27	John Fisher	Strap Fastening	3 „
442	27	The Colebrookdale Company	Fender	3 „
443	28	James Jones	Lamp	3 „
444	28	John Ridgway	Plate	1 „
445	30	William and Henry Hutchinson	Tube	3 „
446	30	William Hancock	Drawer Knob	1 „
447	2 Nov.	Moritz Platow	Gas Burner	3 „
448 to 449	2	Ibotson and John Walker	Cantoon	1 „
450	4	William Hancock, jun.	Flesh-brush or Glove	1 „
451	4	Thomas Selby	Tobacco-box	3 „
452	5	Woodward, Gandell and Co.	Carpet	1 „
453	9	Thomas Nicholson and Henry Elliott Hoole	Stove	3 „
454	9	Gervase Wheeler	Pencil-case	3 „
455 to 456	9	Solomon Templeton Barr	Hand-bills	1 „
457	11	Kiteley and Fawcett	Carpet	1 „

AMERICAN PATENT FOR WIRE ROPES.

We copy from the *Journal of the Franklin Institute* the following specification of a patent for wire tiller ropes, granted to Isaac M'Cord, Harrisburgh, Dauphin county, Pennsylvania:—

"To all whom it may concern: Be it known, that I, Isaac M'Cord, of the borough of Harrisburgh in the state of Pennsylvania, have invented a new and improved manner of manufacturing round, flexible, wire rope, which may be employed as tiller rope in the steering of vessels, and for other purposes where such flexible rope may be required; and I do hereby declare that the following is a full and exact description thereof:—

"For the purpose of making wire rope suitable for tiller rope, I take iron wire of the size of from No. 27 to No. 30, selecting that of the best quality, and this I anneal in a covered vessel, to protect it from the action of the atmosphere, in the usual way of conducting that process. I have, at the same time, prepared a suitable vessel containing train oil, which I heat to a temperature of from 200 to 300 degrees of Fahrenheit's scale, and when the iron has been brought to a red heat, I immerse it in the heated train oil, and suffer it to cool in that situation; the effect of this process is to give to each of the wires a complete coating of bright tenacious varnish, which not only protects it from rust, but gives it much greater flexibility than is possessed by iron wire prepared in any other known way. I have essayed flax-seed, and other oils, in the same way, without attaining the same end in an equal degree.

"In converting the wire thus prepared into tiller rope, I take about sixty wires of the requisite length, usually from 200 to 300 feet, and extend them out in a straight line, giving them an equal degree of tension. This constitutes one strand of rope. I take three such strands and attach them to a hook on a machine similar to that for laying hemp rope, and I also employ a 'top,' or grooved frustrum of a cone, for laying my wire rope, in a manner similar to that of laying hemp rope. But it is a point of great importance in the manufacturing of round wire rope, that there be no twist whatever in the separate strands, and such twist would be given to them in the ordinary process of laying; to prevent this, I connect each of the strands at their ends opposite to that where the laying commences, to three separate hooks on a wheel or apparatus used for twisting and laying ropes, and which is well known, and by means of this I give a countertwist to the strands during the whole operation of laying, to such extent as shall keep the wires in each strand in a straight line, or parallel to each other, continuing the operation until the laying is completed. I have mentioned the using of three strands for making my rope, but a larger number may be used if preferred. A rope of four strands will be more perfectly round than one of three, but from the same quantity of material the latter will have the greatest strength.

"Having thus fully described the manner in which I manufacture my round, flexible, wire rope, what I claim as my invention, and desire to secure by letters patent, is the employment of the heated train oil in the process of annealing and coating the wire in the manner above set forth; and also the keeping of the wires of each strand without twist in the operation of laying, by giving to them a counter-twist, as above described.—Isaac M'Cord."

DR. W. H. WILSHIRE'S JOURNEY TO MOROCCO.

Communicated by Mr. Daniel Cooper.

In a former number of our Journal we noticed the departure of Dr. W. H. Willshire on a Botanical expedition to the little-known territories of Morocco, Barbary States, &c. Intelligence of his safe arrival at Mogadore has been received, and we hasten to make known what few facts of interest he has recorded in his letters to his friends. The first communication is dated Mogadore, Sept. 6, 1840, of which the following is an extract:—

"I have never been better that I am here, except that my arms are a mass of sores from the bites of the musquitos. Musquitos, flies, and rats are the bane of life here. The Jackalls and Hyænas come down during the night from the hills, and take up the bodies from the Jews' burial-ground, but near here there are no other wild animals. I have been sketching a good deal, and hope to bring away with me what never has been brought before—many drawings of Barbary. You may imagine, however, the state of matters here, when I tell you, that when I go out drawing, I am obliged to be accompanied by a soldier; that they spit upon the ground as I pass, and say I am a fool or a Frenchman who is come to take the place. I dare not draw in front of the town itself, and the Moor who accompanies me refused to stand by me the other day when I wanted to sketch a mosque. Were I to enter a mosque I should be made a Moor of directly; the Jews are obliged to walk past them bare-footed. There is not much to be done in the botanical way before the rainy season commences.

"I shall leave for Morocco I expect in the month of November.

"I cannot in a letter describe the place and people; they are, with the association of reading, all that is beautiful. I saw the *Arabian Nights* tangibly embodied; otherwise ignorance and sensual despotism reign predominant. The familiar impudence of the people here is abundant."

Since the above was written, Dr. Willshire went on a five days' excursion from Mogadore, with a view to explore the surrounding country. In a letter addressed to Mr. Daniel Cooper, dated Mogadore, Oct. 15, 1840, he gives the following description of the nature of the locality:—

"I am in one of the strangest, most outlandish, barren places in the habitable globe; not a flower, a blade of grass, a green thing, save a winged sort of *broom*, is to be seen for miles around the place. I have given up in despair all thoughts of botany (at this season) *here*, as it would be waste of time; I am, therefore, striving to attend to men and manners alone, taking sketches of all the places I can get hold of, and writing down all the strange things of this vast country of sun and sand. I am waiting for the Sultan's permission to proceed into the interior, and I hope to go to some spots where scarcely any Christian has been before me."

It is to be confidently hoped that this traveller will meet with more success, which we little doubt, if he pursues his intended route to the Atlas Mountains, and, under the circumstances (his uncle, Mr. Willshire, being Vice-consul at Mogadore), every practicable facility will be rendered him to pursue his researches with safety to himself, and (from our knowledge of his enthusiasm in the cause of botany) with benefit to that science.

SCIENTIFIC CORRESPONDENCE.

MR. POTT'S APPARATUS FOR SUSPENDING PICTURES.

To the Editor of the "Inventors' Advocate."

SIR,—It is scarcely necessary for me to observe there are sins of omission as well as commission, but it is with the former I unwillingly charge you; as (unlike your usually correct and well conducted journal) you have entirely neglected to record a most important part of the invention of "An apparatus for suspending pictures, &c." in the abstract of the specification which you give in your number of the 24th ult.

In the account of the vertical rods, &c., you follow the description as nearly as an abstract of this sort will allow; but you omit to mention, these rods are suspended from hooks which run in a groove of a horizontal rail moulding; the facilities given by which are particularly shown in the drawings referred to in the specification, and lodged with it at the Enrollment Office.

I fear every one of your readers who may have felt interested to peruse the abstract, must have been quite at a loss to understand how these vertical rods were suspended.

As I am deeply impressed with the value and usefulness of this invention, I beg to inform you, a rail moulding is first fixed directly beneath the cornice—and may, indeed, be adapted to form the lower member of it—to this the vertical rods or chains are suspended by hooks running at the *back, and not touching the front*, by which I trust it will readily be seen the continuous line of moulding is preserved, and that the rail combines within itself a picture rod, and handsome cornice moulding, uniting economy and utility with strength and elegance; qualities seldom found in conjunction. As no doubt the multiplicity of your editorial duties occasioned the omission, I hope to be excused for pointing it out, and am,

Sir, your faithful servant,
M. N.

[We have before explained the difficulty which exists in obtaining a correct abridgment of specifications, as no extracts are allowed to be taken. We endeavor to make our abstracts as correct as it is possible, under the circumstances.]

ORIGINAL REPORTS OF SCIENTIFIC MEETINGS.

(Contributed expressly to the Inventors' Advocate.)

MEETINGS OF THE SCIENTIFIC BODIES OF LONDON,—FOR THE WEEK COMMENCING NOVEMBER 23, 1840.

Monday.	Geographical Society	8	P.M.
	Medical Society	8	P.M.
Tuesday.	Medico Chirurgical Society	8½	P.M.
	Zoological Society	8½	P.M.
	Royal Botanical Society	8	P.M.
Wednesday.	Society of Arts	7½	P.M.
	Microscopical Society	8	P.M.
	Medico-Botanical Society	8	P.M.
Thursday.	Royal Society of Literature	4	P.M.
	Royal Society	8½	P.M.
	Antiquaries Society	8	P.M.
Saturday.	Westminster Medical Society	8	P.M.
	Mathematical Society	8	P.M.

SOCIETY OF ARTS.

Nov. 18. *Mr. Pollock, V.P., in the Chair.*

This was an extraordinary general meeting, for the purpose of discussing an alteration in one of the internal arrangements of the society. It is gratifying to perceive that the members of this excellent institution, (which has effected so much good in its time, and which must be looked upon as the parent of every other scientific institution of importance), begin to feel the necessity of shaping its administration to the wants of the times, and are accordingly bestirring themselves to infuse young blood into its old veins as carefully as it can be done, so as not to undermine its constitution.

The Secretary read the report of the committee of mechanics on several inventions, the greater number of which were *Fire-escapes*. The report contained a demonstration of the disadvantages of a certain construction of *fire-escape*, which several inventors have adopted; viz.—a series of crossed levers resembling the instrument called "*lazy-tongs*."

Numerous presents were announced, and nine new members elected.

LINNÆAN SOCIETY.

Nov. 17. *Edward Forster, V.P., in the Chair.*

Mr. Janson presented specimens of *Neottia Æstivalis*, gathered by him in company with Mr. Branch, near Lyndhurst, in the New Forest, Hampshire, in August last. It is the first time it has been observed in England. Mr. Mann exhibited a beautiful specimen in full bloom of the *Epiphyllum truncatum*, which flowered in a dwelling-house. Mr. Ogilby laid on the table a new species of *Trifolium* (clover) very nearly allied to *T. resupinatum*, but evidently a new species, growing from three to four or five feet high, affording abundance of foliage, and considered excellent fodder. A paper was read, being a "Description of *Aucklandia*, a new genus of *Compositæ*, supposed to be the *Costus* of Dioscorides," by Hugh Falconer, M. D., Superintendant of the Honorable East India Company's Botanic Garden at Saharunpore. The author of the communication, after giving a long account of the botanical character of this new genus, stated that he had named it in honour of Lord George Auckland, governor of India, not on account solely of his office, but in acknowledgment for his services in promoting botanical science to the utmost of his power. The characters are taken principally from the *pappus* (seed-down); it is nearly allied to *Carlina* and others. The root of this plant is supposed to yield the article known to the ancients as the *Costus*, but it is a subject which has long been disputed by botanists of all ages, Dr. Royle considering it might be the root of an umbelliferous plant. Dioscorides mentions several varieties of the Costus, viz., the Arabian, he considers the best. The Indian the next in quality. The third sort he termed the Syrian, which was distinguished by its weight and box-wood-like appearance. The best, however, he considers to be that possessed of a firm texture, dry, not worm-eaten, and the taste hot and biting. The medical properties ascribed to this plant by the ancients were numerous, viz., diuretic, emmenagogue, deobstruent, anthelmentic, &c.

With respect to Dr. Falconer's genus *Aucklandia*, he found it only in the vicinity of Cashmere. It being very limited in its range; he could not discover it in the valley of the Indus Proper. It is a gregarious plant, and occupies the open, moist, sloping sides of the mountains, occurring at a height of from 8,000 to 9,000 feet. In Cashmere, the root, which is the part employed, is chiefly used for the protection of bales of shawls from worms, which its very pungent odour is very well calculated to effect. By the natives necklaces are made of the harder portions of the stems, and hung around the necks of children for affections of the eyes, and with the superstitious idea that it will cause worms to be expelled. The roots are dug up in September and October, when the plant is in full vigor. They are chopped into pieces from two to six inches long, and sent to the market. The quantity annually cultivated at Cashmere, and sold, averages about two millions of pounds weight. It is likewise burnt by the Chinese as an incense, and they consider it a great aphrodisiac, consequently the demand is great for it even at Cashmere. Dr. F. concluded the communication by stating that it was entirely a spontaneous production, and he considers it might with advantage be cultivated on our British possessions on the Himalaya mountains, and would prove a great source of income. The matter is under investigation.

Mr. Gould, who has recently returned from South Australia, exhibited some very beautiful drawings of animals in the library.

BOTANICAL SOCIETY OF LONDON.

Nov. 6. *Dr. H. A. Meeson, in the Chair.*

The Secretary announced that fifteen parcels of British plants had been received since the last meeting, and likewise a collection of foreign plants from Dr. C. F. P. Von Martius of Munich, foreign member of the society. A specimen of *Aspidium rigidum Sw*, found by Miss Mary Beevor, on a hill called Arnside Knot, near Silverdale, Westmoreland, was presented by Mr. Wm. Baxter of Oxford. Mr. W. Gardiner, jun, of Dundee, exhibited a specimen of *Jungermannia Ciliaria* with *calyces*, from Bassies, Clova. A monstrosity of *Trifolium repens* presented

by Mr. H. C. Watson, in which the pistil had become a single leaf, and the segments of the calyx were more or less leaf-like, found at Thames Ditton, Surrey, was also exhibited. A letter was read (addressed to the Secretary) from the Rev. W. T. Bree, on the *Aspidium rigidum*. "Many botanists," says Mr. Bree, "have denied that the plant in question is a true species, or anything more than a variety of *A. dilatatum*. I am at a loss to think how any one on inspection of the fern should pronounce it to be a variety of *dilatatum* or *spinulosum*, except it be that to the above species are to be referred all dubious things that will not very well coincide with any known species; so very distinct did it appear to me, that the moment I saw it I pronounced it to be a new species, or at least as an undescribed British one." Upon referring it to Sir W. J. Hooker, it was pronounced to be the *rigidum*. Mr. Bree found it in the year 1815, only in two or three spots on Ingleboro', Yorkshire, but in one of them it grew vigorously and in large patches. He has cultivated the plant ever since 1815, and has supplied botanists with fronds up to the present time.

Some notes on the ferns *Aspidium dilatatum* and *A. spinulosum*, by Mr. Samuel P. Woodward, were next read. From an examination of the *indusium* with Mr. Sansom, Mr. W. questions the character Mr. Newman (in his recent work on the subject) lays so much stress on, viz., "that it *(spinulosum)* may at once be distinguished from any form of *dilatatum* by the *indusium*, which in *spinulosa* is covered with glandular spines or bristles, while in *dilatatum* it is perfectly smooth." Mr. W. finds, however, that *dilatatum* is frequently surrounded with a fringe of glands. The difference, therefore, between Mr. W.'s plant and the continental consists in the glands of *spinulosum* being dispersed over the *indusium*, while in his *dilatatum* they are confined to the edge. A few other interesting descriptive details were noticed, and a drawing accompanied the communication. The commencement of a most interesting paper was read (to be concluded at the next meeting) on the *Mikania Guaco*, a plant used in South America as a cure for *Hydrophobia* and for the cure of bites of *venomous serpents*, being an extension of facts relative to its worth as a remedy, by Mr. James Harvey of Jamaica.

We defer the insertion of these interesting facts, on account of their length, until our next number.

ROYAL MEDICO-BOTANICAL SOCIETY.

Nov. 11. *W. Tiffin Iliff, Esq., F.L.S., in the Chair.*

The minutes of the last meeting were read and confirmed, and the donations announced. Mr. Judd stated that he had made trials with the extract of senna (exhibited at the last meeting) prepared by Mr. Toller, and found that ten grains of the extract which had been prepared twelve months had the requisite aperient effect. Dr. Farre then called the attention of the society to the four specimens of bark and seeds referred to him to report on, collected and forwarded by Dr. Forbes from Cuba. In the communication accompanying the specimens, it stated that they were all more or less used as medicines in that country. The first was a bark possessed of great vermifuge properties, supposed to be obtained from the *cabbage-tree*, and generally known as *bois de palmiste;* it is not, however, of the same species, although very nearly allied to that plant, which possesses similar properties of expelling worms *(lumbrici);* a decoction is made to which syrup is added. Its use has recently become obsolete.

The second was a bark much employed by the natives as a remedy for *Urethritis*. Dr. Forbes has not, however, found it useful in that disease; he has found it serviceable as a diuretic in dropsies; it is bitter, succeeded by a sweetish taste, and possesses tonic properties. The third specimen was the entire root of the pomegranate, an article not often met with in this country, the bark of the root being the officinal or remedial agent. It is astringent, though not bitter, and is celebrated as a vermifuge, and is alluded to by Celsus, Dioscorides, and Pliny. Its use, however, is now superseded by the oil of turpentine. Dr. Forbes considers this bark superior to the turpentine, as he has witnessed the expulsion of a large tape-worm two hours after taking a pint of the infusion, the worm being expelled quite dead, which is not the case with the turpentine; it acts as a deadly poison on the worm, and, in addition to these properties, it is moderately purgative. The fourth specimen consisted of the physic-nuts (noix de medicine), possessing very decided purgative and emetic properties; the oil has been obtained from them in France, and found as efficacious as Croton oil; it is probably the produce of a species of *Jatropha*, or, at any rate, a *Euphorbiaceous plant*. In Africa, six seeds of the there-called physic-nut, *Jatropha curcas*, usually produce an aperient effect on the natives; the effects appear to vary in different individuals. Dr. Farre stated that the oil may be expressed from the seeds of purgative plants, and yet not produce any purgative effect when administered; but when the seed is eaten, then the peculiar properties are manifested, owing to the virtues or active principle residing in the *embryo* or vital part, which is usually very small.

Dr. Sigmond then rose and delivered an address (as is customary for him to do on the first meeting of the session) stating the objects for which the Society was established, viz., to point out to the profession new and useful plants, and modes of preparing and extracting their active principles, and reporting on them as remedial agents. The Society then adjourned until Nov. 25.

SCIENTIFIC MEMORANDA, AND NOTES ON ART.

Average quantities of ardent spirit and of wine, containing four fluid ounces of alcohol (Sp. gr. 0.825 at 60 deg. *Fahr.*) —

Brandy, about - - -	8 fluid ounces.
Port wine - - -	18½
Claret - - - -	26½
Champagne - - -	32½

Materials of Steam-engines.—The following is given in a Paris paper as the comparative prices in England and France of the materials employed in the construction of marine steam-engines of 450-horse power:—

Materials.	English price, per 100 kil.	French price, per 100 kil.
Iron, - - 80,000 kil.	20 f.—16,000 f.	45 f.—36,000 f.
Sheet iron, 110,000	44 —14,000	65 —71,500
Castings, 275,000	10 —26,500	29 —55,000
465,000	87,000	162,500
If we subtract the French price from the English		87,500
There is the amazing difference of		85,000

Reptiles.—Reptiles are known from the rest of the vertebrated animals by being covered with scales, respiring by means of lungs, and having an imperfect circulation and cold blood, which causes them to be cold to the touch. They increase by eggs, but sometimes the eggs are hatched in the bodies of the mother, and the young, when they are first born, are like their parents. They are divided into the *scaly* and the *shielded* reptiles, according to the structure of the scales and the formation of their skull.—*J. E. Gray, Synopsis Brit. Mus.*

Curious Gall.—Dr. Farre, F.L.S., exhibited specimens, at the Linnæan Society, of a singular form of gall on the leaves of a species of oak from Mexico. The gall consisted of an aggregation of hollow cylindrical tubes, nearly an inch in length, and furnished with a fringed orifice. The tubes were remarkable for their elegance and uniformity; their color was white, suffused with red, especially towards the apex.—*Proceedings of Linnæan Society*, 1840.

Agate Shell.—In the Mag. Nat. Hist., Mr. Daniel Cooper records an additional instance of this shell being found in connection with Danish remains; in the *tympanum* of a skull found at Limbury, a hamlet of Luton, Beds., in conjunction with pottery, urns, and a key, supposed of Danish origin. In addition to the perfect chain of *bones of the ear*, were found the lower two whorls and a half of a shell, which proved to be the remains of *Achatina Acicula* (needle agate shell), a species of rare occurrence at the present time in the vicinity of Luton.

Petroleum is a mineral oil, rather thicker than tar, and of a reddish brown color: it has obtained its name from the circumstance of its oozing out of rocks like oil. In the East it is burnt as oil. It is unctuous to the touch, and exhales a strong and unpleasant odour. It is lighter than water, its specific gravity being 0.87. In the island of Zante, petroleum is at the present time obtained from the same spot and in the same manner as in the days of Herodotus. The most powerful springs producing petroleum are on the Irawaddi, in the Burman empire. In one locality there are said to be 520 wells, yielding annually 400,000 hogsheads of petroleum. It occurs in most countries where coal is found.—*Dr. Humble's Dict. Geol. and Min.*

Atmospheric Phenomena.—At the recent meeting of the British Scientific Association a letter from India was communicated, which described a most remarkable shower of grain that took place last March near Rajket, in the Presidency of Bombay. It occurred during one of those thunder-storms to which that month is liable; the grain not only falling upon the town, but upon a considerable extent of the adjoining country, and being a kind quite unknown to the natives. A corresponding, yet more curious circumstance, the truth of which was long doubted, happened about 60 or 70 years since in the district of Madras, when Major Harriott, author of *Struggles through Life*, observed a fall of fish, numbers dropping on the hats of some European soldiers who were in full march across the spot, and being made into a curry for the commanding officer.

VARIETIES.

The Theatres.—The "Midsummer Night's Dream" has been put upon the stage at Covent Garden Theatre this week, in a manner which, if it does not realise the ideas of the readers of that dramatical poem, does as much towards it as stage scenery, machinery, and human figures can do. It is a most splendid exhibition, and as such it is likely to prove very attractive. The Adelphi has brought out a burlesque representation of the "Beggars' Opera," in which the male and female characters are reversed. It serves the purpose of producing constant laughter and as a the whole is comprised in one act it is not too long to be tiresome. It promises to "take" amazingly.

Ancient Artillery.—The cutter Lalla Rookh, belonging to Messrs. Deane and Edwards, left Portsmouth on Wednesday last, bound to Woolwich Arsenal, with several more of those antique iron cannon, of which they have recovered so many of late from the Mary Rose, at Spithead, which was sunk there in the reign of Henry the Eighth, when Sir G. Carew and nearly 600 men perished. Two of the above, and the last obtained, are the largest and most perfect specimens of the primitive guns of any they have recovered, and clearly show the extraordinary manner in which they were used, which is by removing two iron wedges and a block of wood at the breech, and sliding back the chamber from the main body of the gun, which, when charged with powder, and the stone-shot deposited in the inner part of the large bore, is to be replaced and again secured with the wedges and block; so that it appears neither the powder nor shot was put in at the muzzle-end. There are several parts of guns of similar make in the Tower of London and other repositories, but, it is believed, none to be found but these which show the precise method by which they were used. Messrs. Deane and Edwards's operations are closed for the season, after having recovered one brass and about twenty iron guns, with iron and granite shot, warriors' bows, part of the mainmast, an anchor, a pump, and several human skulls, a quantity of timber, and a variety of interesting relics and antiquities, which, although immersed in the deep for the term of 295 years, are still in a high state of preservation.—*Kent Herald.*

Steam Navigation to Alexandria.—The Great Liverpool, which arrived at Falmouth from Alexandria on Friday last, has performed the voyage out and home in excellent style. She left Falmouth on the 2d ult., at half-past 2 o'clock a.m., and arrived off Alexandria on the 18th, at 11 o'clock p.m., but came to anchor at half-past 8 a.m., on the 19th. On the return voyage she started from Alexandria on the 28th, at 6 o'clock p.m., and arrived at Falmouth on the 13th inst., at 15 minutes past 7 o'clock p.m.; the voyage out thus occupying 16 days 10 hours; and the voyage home 16 days 14 hours.

Scientific Congress at Turin.—This meeting consisted of upwards of 400 physicians, geologists, natural philosophers, &c., and of six sections. It commenced on the 17th of September, the same day as the meeting at Glasgow. The papers upon which the most animated debates took place were medical, but no important discovery appears to have been announced. The next place of meeting, in 1841, is Padua. The meeting adjourned on the 30th of September.

New Method of Cleaning Glass.—Powder finely indigo, and dip into it a moistened rag, with which smear the glass, and wipe it off with a dry cloth. Very finely sifted ashes, applied by a rag dipped in spirit, will also answer well; but Spanish white is apt to roughen the glass.—*From the French Mechanics' Mag.*

To Join Sheets of Paper.—To prevent the puckering caused by paste or glue, substitute a thick solution of caoutchouc, which being applied to the edges of the paper, is allowed a little time to dry and get sticky before the sheets are joined together.—*Mechanics' Mag.*

Wellington Military Memorial.—It is expected that the equestrian statue in bronze of His Grace the Duke of Wellington will be completed by Mr. Wyatt, the sculptor, in 1843, he contracting, in 1839, to execute the figure in four years. It is said that the statue will be erected on the triumphal arch at the entrance of Hyde-park, and adjoining Apsley-house, the residence of the noble duke. The Duke of Rutland is chairman, and Sir F. Trench vice-chairman, of the committee for superintending the erection of the memorial.

Small Pox.—Dr. Jenner made the first experiment in vaccination in May, 1796. By transferring the pus from the pustule of a milkmaid, who had caught the cow-pox from the cows, to a healthy child, and, publishing the result, the practice spread through the civilised world. The power of the cow-pock as an antidote to small-pox was a fact familiar to the common people for a century before Jenner's promulgation of it. Previous to vaccination, the annual number of deaths from small-pox, in London, was 4,000, or about one in five or six.

ADVERTISEMENTS.

THE LAST MILITARY PORTRAIT of His Grace the Duke of WELLINGTON, by JOHN LUCAS, Esq., will shortly be published; as also, the Portrait, painted for the University of Oxford, by the same celebrated Artist, engraved by S. Cousins, Esq., A. R. A. N.B. The Duke in the costume of the Corporation of the Trinity House is now ready, and to be had of Mr. Moon, Her Majesty's publisher, 20, Threadneedle street, to whom applications for either of the former portraits are respectfully requested to be made.

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Also

HOLMES's Patent for Improvements in Naval Architecture, and Apparatus connected therewith.

"All persons who examine this patent, must admit Mr. Holmes to have fully established the principles insisted on in his report to the East India Committee, in 1838, of the practicability of building iron ships without limits to size, and on the indispensable necessity of the adoption, not only of much larger ships than had been contemplated, but that it was equally indispensable, in point of profit, that they should be built of iron, and by the adoption of his improvements a great reduction in the first cost and in the wear and tear would be effected. Many parts of these improvements are, however, equally applicable to wood ships, as regards safety to the passengers; and wherever they are adopted, we cannot conceive any case or circumstance in which a ship can be placed in danger. In the fullest sense of the word, they become life-boats, without waste of room, or extra cost."—*From the "Inventors' Advocate," July 1.*

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VINEGAR.—"It is generally the rule to judge of the progress of any country towards civilization by the advances made by it in the arts and sciences. Should any one so judge of us by our manufacture of vinegar, how wofully deficient should we appear in our boast of being the most civilized nation in the world."—Polytechnic Journal. The acknowledged superiority of foreign vinegars, both for quality and flavour, having induced Messrs. GRIMBLE and Co., to give the subject an attentive consideration, they have now the satisfaction to inform the public that they have succeeded in manufacturing a VINEGAR, equal if not superior, in the estimation of the best judges, to that of any foreign country. The agreeable flavour, unalterable purity, and brilliancy of this commodity, and consequent adaptation for pickling, render, in this respect the Royal Orleans a vinegar surpassing in quality that of the finest continental production. The use of salads, so conducive, medically speaking, to the preservation of health, has been injuriously abridged at our tables in consequence of the inferior, or, at all events, uncertain qualities of vinegar as usually prepared in this country. Owing to this cause our pickles and salads are but little esteemed and sparingly used, whilst they are wholly rejected by the foreigner and continental traveller. In order to enable the public fairly to judge of this vinegar in its genuine state, the following are a few of the Italian warehouses where it may be obtained in sealed bottles, at 1s. each, bottle included, or in any quantity:—Finch and Co., 11, Ludgate-hill; W. D. Prichard and Co., 36, Devonshire-street, and 50, Leadenhall-street; R. and C. Faulkner, 44, Jermyn-street, St. James's; Robert Wood, 132, New Bond-street; Barraugh and Fall, 1, New Cavendish-street; W. Hughes, 12, King-street, St. James's; Frost and Hardstaff, 89, High-street, Camden-town; Lawsons, 33, Coleman-street; J. Jackson, 194, Edgeware-road; R. Howse, 47, Albany-street; W. Darby, 6, Queen's-buildings, Knightsbridge; H. Smith, 146, Shoreditch; Robinsons, 10, Great Russell-street, Covent-garden; H. Bentham, 62, Piccadilly; E. and J. Taylor, 17, Lower Holborn; Zetterquist and Son, 60, Blackfriars-road; H. Collins, 88, Fleet-street; Thomas Fraser, 63, New Bond-street; Sledden and Stocking, 42, High-street, Marylebone; J. Garnett, 38, Wigmore-street; Riches and Son, 3, Charles street, Parliament-street; W. Clark, 74, St. John-street; E. Ashby, 1, Old Broad-street; Christopher Heron, Uxbridge, Middlesex; Walkers, Thistle-grove, Little Chelsea; C. Young, High-street, Islington.

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Polytechnic Journal.
Railway Magazine.
Railway Times.
Repertory of Arts.
Transactions of the Society of Arts.

ACTS OF PARLIAMENT.

PATTERNS,—
27 Geo. III., c. 38; 2 Victoria, c. 13; 2 Victoria, c. 17 (The last relates to patterns and *models*.)

PATENTS FOR INVENTIONS,—
2 and 3 Victoria, c. 67.

SCULPTURES,—
38 Geo. III., c. 71.

ENGRAVINGS,—
7 Geo. III., c., 38; 17 Geo. III., c. 57.

COPYRIGHT,—
8 Anne, c. 19: 12 Geo. II., (Booksellers' Act), c. 36; 15 Geo. III, (Universities' Act), c. 53; 54 Geo. III. (General Copyright), c. 156.

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THE

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THE FORCE OF PERCUSSION.

One of the mysteries of mechanical science is the peculiar action of percussion, by means of which a given force will produce far more effect than a much greater force when acting gradually, or by pressure. The fact is admitted, but the causes of the difference in the effects produced by the different actions of the same amount of force have not been clearly explained. It seems to be considered one of the things to be taken for granted, without being inquired into. This, however, is not the way in which such subjects ought to be passed over. The peculiar effect of percussion, which is every day experienced in innumerable instances, forms an interesting subject of inquiry, that well deserves to be investigated. We propose in this article, therefore, to explain our views of the causes of that effect; and to show that there is nothing mysterious, or beyond the range of satisfactory elucidation, in these curious properties of the action of sudden force.

In recent articles in the INVENTORS' ADVOCATE, relating to the actions of pressures and resisting forces—in which time was proved to be as essential to the measurement of those passive forces as it is to the measurement of the momentum of a body in motion—we stated that the same principle was capable of very extended application, and that it would serve to explain many phenomena which have hitherto been involved in obscurity. We shall now have occasion to apply that principle to explain the peculiar action of percussion.

It is well known that if a body moving at any given velocity—say 20 feet a second—penetrate a yielding mass to the depth of one inch, that the same body, when the velocity is doubled, will penetrate to four times the depth, or to four inches. Thus a double velocity will give a quadruple power of penetration to the same body. The cause of this we have previously explained.* It is owing to the action of the resisting force as well as the momentum of the moving body, having reference to time. The resistance offered by the particles of a mass of clay, or of a block of wood, to any body passing through them, acts in the same manner as any other regularly retarding force, in proportion to the *time* in which its resisting power is exerted. That is to say, there would be little more resistance offered to a ball passing through ten inches of either substance, than to its passage through one inch of the same, provided the one ball moved with ten times the velocity of the other. In the same manner it may be ascertained, that when two moving bodies of unequal weight are propelled with differing velocities, so as to make the momentum of each the same, the power of penetration will be greater in the lighter body that moves more quickly, than in the heavier slow-moving body. For instance, if a ball of two pounds weight were propelled with a velocity of 500 feet a second, and another ball of one pound, but of the same size, were propelled with double the velocity of the first, the momentum of both would be equal; but the one-pound ball would penetrate a mass of clay to twice the depth that the heavier and slower-moving ball would penetrate. It might be supposed, that as the momenta and size of the two balls are assumed to be equal, the degree of penetration would be the same in both. The fact that it is otherwise might, at first view of the case, be considered a proof that the momentum of the faster moving ball must be the greater. The effect of the two balls, however, in communicating motion to other bodies, would be found to be the same, and it is only when they act upon resisting substances that any difference in the amounts of their effects is perceivable.

The cause of the difference in their powers of penetration is easily resolvable upon the principle that the amount of the resisting force is to be measured by time, and not by the extent of penetration. The resistance which the ball moving with the velocity of 1,000 feet a second would meet in its passage through ten inches of a uniformly resisting medium would not be greater than the resistance the other ball would encounter in passing through five inches, for the *time* would be the same in both. The difference of effect is not caused by difference in the momenta of the two bodies, but by the circumstance that the substance penetrated is better able to resist a slow moving body than a quicker one. The same cause which makes two bodies possessing the same momentum, but moving with different velocities, act with different effects on a yielding mass, also obtains when the substance against which they strike is unyielding. We might, for instance, show this to be the case by repeating the experiments with substances gradually harder and harder, until we at length acted on a substance on which no indentation could be produced. For instance; finding that the lighter ball, which acquired the given momentum by increased rapidity of motion, rose higher in the air against the retarding force of gravitation than the heavier ball, we might next try the experiment in water; then on a mass of clay; next on soft wood; and so proceed to the hardest substances, on which no effects could be discerned. We must presume, from analogy, that as all the substances wherein the effects of the two balls could be traced yielded more to the faster moving, though lighter ball, that the tendency of the latter to overcome resistance is also greater on the substances whereon no discernible effects are produced.

When the difference between the weights and the velocity is greater than in the cases before assumed, the difference of their effects on harder substances becomes very apparent. The end of a hammer may be pressed against a piece of solid oak with a force of several hundred pounds without producing any sensible impression: but if the hammer were to be smartly struck against the wood with much smaller force, the oak would be strongly indented. This effect is owing to the same cause we have before explained. The action of the cohesive attraction which binds the particles of the wood together has reference to time, as well as the force of gravitation and all other forces. It only exerts a certain force in a given time, and when any hard body strikes against the wood with great velocity the particles give way before it, because it brings a greater amount of force to bear on the point in a given time than the attraction of cohesion which holds them together is able to exert in the same time. When any brittle substance is substituted for oak, the difference of effect is still more extraordinary. A piece of glass which will bear a great *pressure* on any point, if struck with half the power that before pressed against it will be broken to pieces. This effect depends, as before, on the concentration of the momentum of the body in a greater degree than the resisting force of the attraction of cohesion can withstand.

The manner in which percussion is most commonly applied, in driving nails and wedges, affords perhaps a more clear exemplification of our theory than any other mode of its operation. The resistance of the wood to the entrance of the nail or wedge being assumed to be uniform, and to act as pre-

* Inventors' Advocate, Nos. 56 and 58.

viously explained, in reference to the time, the proportionate resistance according to space, will be diminished with the velocity of the impelling force.

It would extend this article too far to attempt to exemplify our theory by reference to further instances of the action of percussive force. It will however be found applicable to all cases of percussion. What we contend for is, that the force of percussion is not greater than the same amount of power steadily exerted, and that the difference in the effects of the same force differently applied, depends merely on the nature of the resisting bodies on which the forces act: that is to say, the attraction of cohesion having a definite time of action, any body moving with great velocity will meet with less resistance in its passage through a solid substance than if it moved more slowly, even when the absolute momenta of both are the same.

MANUFACTURES IN THE NORTH OF FRANCE.

The following description of the state of manufacturing industry in the Department of the North, is translated from a Brussels paper, *L'Emancipation*. It affords some insight into the rapid strides our neighbors are making in perfecting themselves in manufactures, and in adopting English machinery for their operations. It shows at the same time the peculiar capabilities of that province of France for manufacturing operations requiring supplies of coal and metals.

They who visited the Department of the North fifty years ago, could scarcely doubt that an astonishing progress in manufactures was likely to take place in that part of France. Since that period, new mines for the discovery and extraction of coal and metals, and the investigation of new means of improvement, have been continually in progress. This narrow tract of country, bordering on the Belgian frontier, appears to contain all the principal materials of prosperity which are contained in the southern and western provinces of Belgium. The soil of the Department of the North is nearly the same as that of Hainault and Flanders, and the coal-beds situated on the upper strata are continued below the course of the Scheldt.

The great progress in manufacturing industry is doubtless to be attributed to a variety of causes. There are some which may be referred to the general situation of France; but there are others, perhaps as powerful as the former, which are peculiar to the Department of the North. Among the principal of the latter must be reckoned the improvement and progress of inland communication. The canals, in particular, which are the chief means of conveyance for the manufactures of this country, have been the objects of especial consideration. The interior lines of navigation had two objects to accomplish, to bring into closer connection the various places in the department, and to bring that vast centre of production into communication with the markets of other parts of France.

The general system of communication by means of inland navigation in the Department of the North, had been studied and investigated with singular ability by M. Cordier, when chief engineer of the bridges and roads in this department. It was M. Cordier who designed and executed the canal from the Sensée, intended to connect Dunkirk with Paris; and the canal of High and Low Deule, which unites the canals in the north of France with those in the centre and south. Independently of the formation of these two useful canals, M. Cordier projected a canal from the Scheldt to the Sambre, which will most probably be executed in the course of a few years; of a side canal to the Aa, and of a canal on a very large scale from Gravelines to Dunkirk. This engineer has given proof of a very extensive acquaintance with manufactures and commerce, in the pages of his work, in which he investigates what new communications would be most beneficial to the manufactures of the north, and in which he states the reason which induces him to anticipate advantages from the opening of any canal which he projects.

There can be no doubt that this great facility of inland communication,—that this passage of canals through—the centres of production, has had great influence on the progress of manufactures in the Department of the North. The improvement of the roads already opened has likewise powerfully contributed to secure the regularity, permanence, and progress of inland navigation. Water conveyance and manufacturing produce have been considerably increased in consequence of this general formation of canals; other causes have likewise combined to advance the progressive improvements of manufactures. For example, the improvements made in the modes of operating, and particularly the introduction of machines and apparatus that hitherto had not been used in France, and the discovery of coal in a number of places where the existence of this mineral was not suspected, has rendered this important substance more plentiful.

The coal mines in the Department of the North appear concentrated along the valley of the Scheldt. The oldest established and the most considerable station where the coal mines are worked is at Anzin near Valenciennes. On leaving this place, and descending the valley from the Scheldt, the two groups of coal mines of Dénin and Douchy successively present themselves; the first is situated on the left bank of the Scheldt; the pits there are neither very deep nor very numerous. Douchy is situated on the other bank of the river. It is from the foot of this magnificent group of coal mines that the canal from the Scheldt to the Sambre is to commence. But independently of these canals adjacent to the valley of the Scheldt, improvements have been made in the course of the latter river which passes near all the places where the mines are worked, and is used as a medium of general conveyance. At Dénin the wagons loaded with coal are drawn on a railway to the bank, and an ingenious apparatus lets down the contents of the wagons into the boats, so as to avoid the expense of the usual method of loading.

Beyond Valenciennes, at Fresne, the works undertaken for the discovery of coals have been crowned with success. Thus the valley of the Scheldt in the whole of its extent through the Department of the North indicates the existence of coal-beds.

The coal mine at Anzin is the oldest and most considerable. The pits comprising this group of coal mines are, if we may use the expression, the classical mines of the north of France. It was at Anzin that the art of ventilation, and the general method of working coal mines, was studied, and it must be said that the ideas then entertained on the subject were generally correct. The coal at Anzin is worked on the same principle as in Belgium; the coal strata are there found in a zig-zag direction like a combination of a number of the letter Z.

The ladders which are used for descending into the pits are usually less steep than those used in Belgium. The separations established in the galleries to regulate the course of ventilation are generally formed merely of curtains, but the mode of ventilation is quite peculiar, and affords ample security.

Furnaces are employed to increase the ventilation. But these furnaces, instead of being acted on by the impure air which has already passed through the coal mines, are supplied with a stream of pure air. By this means the danger is avoided of causing the air impregnated with carburetted hydrogen coming in contact with an open fire. It is the smoke and the heated air, which go up the ventilating shaft, where the foul air is heated and made to ascend. Thus the inflammable atmosphere of the coal pit comes in contact only with the smoke and heated air, but never with the flame of the ventilating furnace. The result with respect to ventilation is nearly the same, and the danger of explosion is considerably diminished. It will be conceived that it is not very difficult to detach a stream of air from the descending column before it becomes impregnated with the bad air, to convey it to the furnace before it traverses the passages of the coal working. It is this arrangement which most particularly distinguishes the coal mines of Anzin; but this depôt of industry has for engineers many other claims to celebrity. The company who are proprietors of these works have established magnificent workshops, known by the name of the magazines d'Anzin, where steam engines and engines for draining are manufactured. These magazines are particularly remarkable for the mechanical processes employed, and for the machines which are used in the execution of the different works. The workshops are particularly remarkable for the order and punctuality with which they are regulated. We shall endeavour to describe in a summay manner the different parts of this fine establishment. The buildings which constitute the magazines of Anzin form an immense square court, one side of which is occupied by the rope walk. This part of the building passes over beyond the angle of the court, and extends beyond the square. The workshop is a long covered gallery of more than a hundred metres in extent.

Opposite to the ropery, on the other side of the square, there is a cabinet of models for castings. Here there is a curious collection of all kinds of rails, that have hitherto been used or projected, excepting the rails on the road of St. Germain.*

Here also are kept a great many models of wheels, in which the form and proportions of the collars and tires vary in a thousand different ways. Special workmen of superior ability daily manufacture new models, other workmen also construct from these models the sand moulds in which the iron is poured when in a state of fusion. In other parts of these immense workshops, works of an entirely mechanical nature are carried on. The machine for boring the cylinders of steam engines or of air pumps; the machine for planing wood, and that for polishing metals, work with extraordinary rapidity. Mr. Brunell's circular saw cuts through and divides pieces of wood in an instant; the machine for making grooves in wood cuts rapidly into the blocks with its iron nails. It is by the means of steam that all these operations are done. This moving steam engine, a stove for the copper foundry, and a gazometer where the gas to light the workshops is prepared, complete this establishment. We cannot describe in detail the operations of the founding of metals, nor the labours of the wheelwright and joiner. The latter are the necessary accompaniments of this vast assemblage of workshops for the construction of machines.

Several locomotive steam-engines have been constructed at Anzin. They are principally of small dimensions, the road they had to traverse being narrow; they were constructed according to Stephenson's plan. A considerable part of the workshops of Anzin is devoted to the making of railway wagons, for the conveyance of coal, as well as for passengers on the railroad of Denin.

(To be Continued.)

COTTON MANUFACTURES OF GREAT BRITAIN AND THE UNITED STATES.

The most momentous question which has ever yet arisen to affect the permanence of our superiority as a manufacturing nation is the rivalry which has been springing up against us during the last twenty years in the United States. Antecedent to that period, their frequently abortive, and always insignificant, attempts at the manufacture of cotton could not be regarded in the light of competition; but in the brief interval which has since elapsed, by

* The St. Germain railway company use rails, the top and bottom of which are the same. By this means when the top surface is worn out by the action of the wheels, they are reversed, and are as good as new.

calling in Britiah skill to teach them how to turn their great natural advantages to account, they have made a atride towarda overtaking us which ahould warn us, that a timely exertion of all our prudence and energy ia required, if we would keep the lead aa we have hitherto done.

We are not able to lay our hands upon any authentic account of the number of cotton mills in the United States of a more recent date than 1831; but we have aome meana of approximating to the number in 1837. In 1831 the total number of milla was 801, turning out yearly 230,461,990 yards of cloth. Of theae, 256 belonged to the State of Massachusetts; and by an authorised survey of the State in 1837, it appears that they had then increased to 282, or about ten per cent. This, however, will give but a very inadequate idea of the actual increase of *manufactures* in the period. Of the above number of yards of cloth manufactured in 1831, Massachusetts returned 79,231,000 yards; and in 1837 ahe returned 126,319,221 yards—an increase verging on *sixty* per cent. Supposing a proportionate increase in the other States, the whole quantity manufactured in 1837 must have been upwards of 368,000,000 yards. The quantity, large as it is for a young manufacturing country, ia not ao important a conaideration as the rapidity of ita increase; for it is by *that* we must judge of what we may hereafter have to contend with. Another remarkable circumstance (and which will account for the goods manufactured increasing in amount ao much faster than the mills in number,) ia, the growing preference of male to female labor—one of the strongest indicia of a thriving and apirited manufacture that can be given. In 1831, the proportion of women to men employed in Massachusetts was aomewhat more than 4 to 1; in 1837 aomewhat lesa than 3 to 1—the total increase of hands in the period being about *fifty per cent.* The increase of females was only 28, that of male hands 86, per cent. Where there is such an employment of the most effective and costly description of labor, business must be going on thrivingly, and milla will not multiply in the same ratio as the work accomplished. While on this part of the subject we may mention, *en passant*, that in 1837 the amount of capital invested in the cotton manufacturea of America, is stated by a competent authority (Mr. Montgomery, the author of a valuable work on this subject), to have been one-fourth of the amount of capital invested in those of England!

But in order perfectly to appreciate the progreas of the Americans in the cotton manufacture, we must take a survey of the rise and present state of a few of their manufacturing stations. And, first at Lowell, in Massachusetts, not inaptly termed the American Manchester. Twenty years ago it was a barren plot of some two thouaand acres, occupied by a few settlers, who were half farmers, half fishermen. This amphibious little community is now replaced by a population of twenty thouaand soula; and where stood only a few fishing huts on the banka of the Merrimack and Concord, now atand twenty-nine factories (exclusive of print worka) employing nearly 9,000 hands. The capital and atock invested in these factories is about 8½ milliona of dollars, and the work turned out annually amounts to upwards of 53 millions of yarda. Considering that none of these factories were in existence eighteen yeara ago, Lowell must be considered as yet in its infancy. Passing by Rhode Island and Connecticut we come to Paterson, in New Jersey, the next in importance to Lowell. Twenty-five yeara ago there were not then ten housea in the place. In twelve years it became a bustling manufacturing town, with upwards of six thousand inhabitants. The last place we shall mention (for we are merely giving instances of the rapidity with which cotton manufactories spring up and arrive at full vigor in the United States), is Saco, in the State of Maine, where the manufacture of cotton is, perhaps, carried to the greatest perfection in America, though only established so late as 1833.

We have hitherto been merely glancing at the Eastern States of America, as an evidence of what she has already accomplished; but if we wish to form a correct and aafe notion of her full capabilities, we must turn our attention to the *Southern* States. With water-power almost everywhere at hand, and themselves the growers of the staple, and with an abundance of cheap slave labor, which is reported to have been found far more congenial to the factory than the field, it is almost in the course of nature that they should soon outstrip even their own aister states of the East. In North Carolina, there are already eleven factories for *spinning* cotton; at Cincinnati, there are four or five; at Petersburgh, five or six; and at Richmond, Manchester, and other placea, the commencement has been made. In the Southern States, too, there is no want of adventurous spirit. If ever there was a country in the world where the passion for making money regards neither impediment nor danger, it is the United States; and it is not likely that people of auch a temperament will long defer the attempt to make themselves the chief manufacturers, as they already are the chief growers, of cotton for the world, now that their less favorably aituated fellow-countrymen in the east and north have proved to them (under present circumstances) the practicability of it. It is clear that within a few years we shall have a struggle with them for the superiority; and we should consider impartially the extent and character of the advantagea which each party possesses (aa matters now stand) for the conflict.—*Journal of Commerce.*

PATENTS.—BRITISH AND FOREIGN.

MONTHLY LIST OF NEW PATENTS.

JOHN DUNCAN, of Great George-street, Weatminster, gent., *improvements in machinery for cutting, reaping, or severing grass, grain, corn, or other like growing plants or herbs.*—6 months, being a communication, Nov. 2.

ELIJAH GALLOWAY, of Manchester-street, engineer, for *improvements in propelling railroad carriages.*—6 months, Nov. 2.

JOSIAH PUMPHREY, of New Town-row, Birmingham, brass-founder, for *certain improvements in machinery to be employed in the manufacture of wire hooks and eyes.*—6 montha, Nov. 2.

HENRY WIMSHURST, of Limehouae, ship-builder, for *improvements in steam vessels in communicating power to propellers of steam-vessels, and in shipping and unshipping propellers.*—6 months, Nov. 2.

JAMES HEYWOOD WHITEHEAD, of Royal George milla, York, manufacturer, for *improvements in the manufacture of woollen belts, bands, or driving straps.*—6 months, Nov. 2.

JAMES BOYDELL, jun., of Cheltenham, for *improvements in working railway and other carriages, in order to stop them, and also to prevent their running off the rails.*—6 months, Nov. 2.

JOHN EDWARD ORANGE, of Lincoln's-inn Old-square, captain in the 81st Regt., for *improvements in apparatus for serving ropes and cables with yarn.*—6 months, Nov. 2.

HERMAN SCHROEDER, of Surrey Cottage, New Peckham, broker, for *improvements in filters.*—6 months, being a communication, Nov. 2.

JOHN WORDSWORTH ROBSON, of Wellclose-square, artist, for *certain improvements in water-closets.*—6 montha, Nov. 2.

RICHARD FARGER EMMERSON, of Walworth, gent., for *improvements in applying a coating to the surfaces of iron pipes and tubes.*—6 months, Nov. 3.

JOHN RAPSON, of Limehouse, mill-wright, for *improvements in paddle wheels for propelling vessels by steam or other power.*—6 months, Nov. 5.

HENRY HIND EDWARDS, of Nottingham-terrace, engineer, for *improvements in evaporation.*—6 montha, Nov. 5.

PIERRE MATHEW MANNOURY, of Leicester-square, gent., for *improvements in wind and stringed musical instruments.*—6 months, being a communication, Nov. 5.

GEORGE GWYNE, of Duke-street, Mancheater-aquare, gent., for *improvements in the manufacture of candles, and in operating on oils and fats.*—6 months, Nov. 5.

GEORGE DACRES PATERSON, of Truro, Cornwall, Esq., for *improvements in curvilinear turning, (that is to say) a rest adapted for cutting out wooden bowls, and a self-acting slide rest for other kinds of curvilinear turning.*—6 months, Nov. 5.

CHARLES JOSEPH HULLMANDEL, of Great Marlborough-street, lithographic printer, for *a new effect of light and shadow, imitating a brush or stump drawing, or both combined, produced on paper, being an impression from a plate or stone, prepared in a particular manner for that purpose, as also the mode of preparing the said plate or stone for that object.*—4 months, Nov. 5.

HENRY KIRK, of Blackheath, gent., for *improvements in the application of a substance or composition as a substitute for ice for skating and sliding purposes.*—6 montha, Nov. 5.

JOHN CLARKE, of Islington, Lancaster, plumber and glazier, for *an hydraulic double action force and lift pump.*—6 months, being a communication, Nov. 5.

GEORGE DELIANSON CLARK, of the Strand, gent., for *an improved method of purifying tallow, fats, and oils for various uses, by purifying them and depriving them of offensive smell, and by solidifying such as are fluid and giving additional hardness and solidity to such as are solid; and also by a new process of separating stearine or stearic acid from the elaine in such substances.*—6 montha, being a communication, Nov. 5.

ALEXANDER HORATIO SIMPSON, of New-palace Yard, Westminster, gent., for *a machine or apparatus to be used as a moveable observatory or telegraph, and as a moveable platform in erecting, repairing, painting, or cleaning the interior and exterior of buildings, and also as a fire escape.*—6 months, being a communication, Nov. 5.

ANDREW KURTZ, of Liverpool, manufacturing chemist, for *a certain improvement, or certain improvements in the construction of furnaces.*—6 montha, Nov. 5.

GEORGE HALPIN jun., of Dublin, civil engineer, for *improvements in applying air to lamps.*—6 montha Nov. 7.

WILLIAM CROFTS, of New Radford, machine-maker, for *certain improvements in machinery for the purpose of making figured or ornamented bobbin into a twist lace and other ornamental fabrics, looped or woven.*—6 montha, Nov. 7.

CHARLES DE BERGUE, of Blackheath, gent., for *improvements in machinery for making reeds used in weaving.*—6 months, being a communication, Nov. 7.

EDWARD DODD, of Kentish Town, musical instrument maker, for *improvements in pianofortes.*—6 months, Nov. 7.

GEORGE EDMUND DONISTHORPE, of Leicester, machine maker, for *certain improvements in machinery or apparatus for combing and preparing wool and other textile substances.*—6 months, Nov. 7.

JOHN JOSEPH MECHI, of Leadenhall-street, cutler, for *improvements in apparatus to be applied to lamps in order to carry off heat and the products of combustion*—2 montha, Nov. 10.

THOMAS LAWES, of Canal Bridge, Old Kent-road, feather factor, for *certain improvements in the method, or process, and apparatus for cleansing and dressing feathers.*—6 montha, Nov. 10.

WILLIAM M'KINLEY, of Manchester, engraver, for *certain improvements in machinery, or apparatus, for measuring, folding, plaiting, or lapping goods or fabrics.*—6 montha, Nov. 10.

CHARLES EDWARD AMOS, of Great Guildford-atreet, Borough, millwright and engineer, for *certain improvements in the manufacture of paper.*—6 months, Nov. 10.

THOMAS WILLIAM PARKIN, and ELISHA WILDE,

of Portland-street, Liverpool, engineer, for *an improved method of making and working locomotive and other steam-engines.*—2 months, Nov. 12.

EUGENIUS BIRCH, of Cannon-row, Westminster, civil-engineer, for *improvements applicable to railroads, and to the engines and carriages to be worked thereon.*—6 months, Nov. 12.

JOHN HEATON, of Preston, overlooker, for *improvements in dressing yarns of linen or cotton, or both, to be woven into various sorts of cloth.*—6 months, Nov. 12.

OTTO C. VON ALMONDE, of Threadneedle-street, merchant, for *improvements in the production of mosaic work from wood.*—6 months, being a communication, Nov. 12.

CHARLES DOD, of Buckingham-street, Adelphi, gent., for *certain methods or processes for the manufacture of plate glass, and also of substances in imitation of marbles, stones, agates, and other minerals, of all forms and dimensions applicable to objects both of use and ornament.*—4 months, being a communication, Nov. 12.

CHARLES WYE WILLIAMS, of Liverpool, civil engineer, for *certain improvements in the construction of furnaces and boilers.*—6 months, Nov. 17.

JOSHUA SHAW, of Goswell-street-road, artist, for *certain improvements in discharging ordnance, muskets, fowling pieces and other fire arms.*—6 mths., Nov. 17.

JOSEPH WHITWORTH, of Manchester, engineer, and JOHN SPEAR, of the same place, gent., for *certain improvements in machinery, tools, or apparatus for cutting and shaping metals and other substances.*—6 months, Nov. 17.

JAMES DEACON, of Saint John-street-road, gent., for *improvements in the construction of glass chimneys for lamps.*—6 months, Nov. 19.

ALEXANDER STEVENS, of Mancheater, engineer, for *certain improvements in machinery or apparatus to be used as an universal chuck for turning and boreing purposes, which said improvements are also applicable to other purposes.*—6 months, Nov. 19.

WILLIAM HENSON, of Allen-atreet, Lambeth, engineer, for *improvements in machinery for making or producing certain fabrics with threads or yarns applicable to various useful purposes.*—6 months, Nov. 19.

JOHN COX, of Ironmonger-lane, civil engineer, for *certain improvements in the construction of ovens, applicable to the manufacture of coke and other purposes.*—2 months, Nov. 21.

JOHN WAKEFIELD, of Salford, hat manufacturer, and JOHN ASHTON, of Manchester, hat manufacturer, for *certain improvements in the manufacture of hat bodies.*—6 months, Nov. 21.

WILLIAM HENRY HUTCHINS, of Whitechapel-road, gent., and JOSEPH BAKEWELL, of Brixton, civil engineer, for *improvements in preventing ships and other vessels from foundering, and also for raising vessels when sunk.*—6 months, Nov. 21.

FRANCIS POPE, of Wolverhampton, engineer, for *improvements in detaching locomotive and other carriages.*—6 months, Nov. 24.

JOHN HAUGHTON, of Liverpool, clerk, M. A., for *improvements in the means employed in preventing railway accidents, resulting from one train overtaking another.*—6 months, Nov. 24.

HENRY CHARLES DAUBENY, reaiding at Boulogne, esq., for *an improvement in the making and forming of paddle wheels, for the use of vessels propelled on the water by steam or other power, and applicable to propel vessels and mills.*—6 mths., Nov. 25.

THOMAS BARRATT, of Somerset, for *improvements in the manufacture of paper.*—6 months, Nov. 25.

JUNIUS SMITH, of Fen-court, Fenchurch-atreet, eaq., for *certain improvements in furnaces.*—6 months, being a communication, Nov. 25.

CHARLES GRELLETT, of Hatton-garden, for *new modes of treating potatoes in order to their being converted into various articles of food, and new apparatus for drying applicable to that and other purposes.*—6 months, being a communication, Nov. 25.

WILLIAM HENRY BAILEY WEBSTER, of Ipswich, aurgeon, for *improvements in preparing skins and other animal matters, for the purpose of tanning, and in the manufacture of gelatine.*—6 months, Nov. 25.

OLIVER LOUIS REYNOLDS, of King-street, Cheapside, merchant, for *certain improvements in machinery for producing stocking fabric or framework knitting.*—6 months, being a communication, Nov. 25.

NATHANIEL BATHS, of Mancheater, engineer, for *certain improvements in machinery, tools, or apparatus for planeing, turning, boreing, or cutting metals and other substances.*—6 months, Nov. 25.

FREDERICK THEODORE PHILIPPI, of Bellfield-hall, calico-printer, for *certain improvements in the art of printing cotton, silk, and other woven fabrics.*—6 mths., Nov. 25.

JAMES LEE HANNAH, doctor of medicine, of Brighton, for *an improvement or improvements in fire escapes.*—6 months, Nov. 25.

ROBERT ROBERTS, of Bradford, blacksmith, for *a new method or process for casehardening iron.*—6 months, Nov. 25.

HENRY WALKER WOOD, of Chester-square, gent., for *an improvement in producing an uneven surface in wood and other substances.*—6 months, being a communication, Nov. 25.

PATENTS NOT SPECIFIED THIS MONTH WHEN DUE.

WILLIAM BEETSON, of Brick-lane, Old-street, brass-founder, *improvements in stuffing-boxes, applicable to water-closets, pumps, and cocks,* due Nov. 5.

SPECIFICATIONS OF ENGLISH PATENTS.

ENTERED AT THE ROLLS CHAPEL OFFICE.

(*Continued from page* 324.)

GEORGE JOHN NEWBERY, of Cripplegate-buildings, *certain improvements in rendering silk, cotton, woollen, and other fabrics waterproof,* Nov. 12.—Claim firat.—The improved modes, methods, or modifications hereafter described, of applying subatances to auch saturated textures, so as to prevent one face thereof from drying, hardening, or forming a pellicle thereon, while the other side is allowed so to do by the action of the atmosphere or artificial heat to which it ia exposed, evaporating a portion of the aqueoua or volatile parts of the oils or compositions, and then afterwards clearing away the moist parts by the agency of apirits of turpentine, or other auitable liquid.

One method is to have oil baths, about half an inch deep, and of proper dimensions to allow the frame containing the strained ailk or fabric to float thereon, the upper surface being left exposed to the action of the atmosphere or artificial heat.

Another mode is by merely laying the saturated fabric on a surface, non-absorbent to oila, or other such matters, such surface being covered with a coat of the waterproof composition, of about the same thicknesa as a coat of oil paint as usually laid on a wall. The fabric having been previously rolled up is then unrolled on the coated surface, and apread out smoothly by the hands of the workman, or by any other convenient means.

Another mode is to strain two pieces of fabric on a atretching-frame, so that two of their surfaces are placed evenly and closely in contact, and they are then aaturated with the waterproofing compoaition, so that the outer surfacea will become hard, and the inner surfaces will remain moiat, by the waterproofing material not being allowed to dry.

Another mode ia to strain the fabric or texture on a frame, and then give it a coating on both aides, so as thoroughly to aaturate it with the inspiaaated oil, or composition, and when this is beginning to set, a coat of plain linseed oil ia carefully laid on one surface without disturbing the first coating; and when the reverse side is dry, or the pellicle sufficiently formed, the coatings on the protected aide may be removed by clearing the aurface with spirits of turpentine.

Another mode ia by giving the fabric a complete saturation of oil paint, so compounded that it will take a long time to dry, without the addition of metallic oxides; this paint is used thick, and brushed into the fabric. The metallic oxide ie then pounded to an impalpable powder, and aifted or diatributed all over one aurface; by which means one aide will be dried before the other, which may then be washed off in the manner before described.

Another mode is by thickening the oil with lamp black, ao as to render it of a buttery consistence. One side of the fabric ia then covered with this composition to a proper drying thickness, and the other side receivea a much thicker coat, which is afterwards scraped off when the thin coat ia dry.

Another method ia by uaing a aecond texture or covering, or air-tight cloth, placed in contact with one aurface in auch a manner as to keep the aeccative composition moist, and looae from the texture, whilst the other side is drying, or the pellicle being formed.

Additional claim.—Any drying oils, seccative composition, or varnishes, having a drying or hardening property, for the purpose of saturating the textures, in the first place, and then by artificial means to cover the outaide of auch texture, that it ahall remain undried, while the other aide dries, hardens, or has a pellicle formed thereon, which ia exposed to the direct action of the air or to artificial heat, and which pellicle is firmly incorporated or attached to that aurface; the other side being protected from the action of the air or heat, which enables the moist part or coating to be cleared away, so as to leave the texture with the original appearance of its outer surface unimpaired, or nearly so.

Claim aecond.—The mode, manner, or proceas of producing damask patterns or designs on the aurface of such fabrics as above named.

Thia is effected in the following manner.—Instead of a plain surface as used in the simple waterproofing process, one with the desired pattern formed thereon is used, such pattern being sufficiently counteraunk or raised, after the manner of calico or paper-atainers' blocks. The raised parts being kept in contact will prevent the composition from drying or hardening, and thereby a great variety of ornamental devices and colors may be obtained.

Another method is by using perforated plates of any laminated material, and placing the same between two aurfacea, which by thia means may be operated on at the same time.

JAMES BUCHANNAN, of Glaagow, merchant, *certain improvements in the machinery applicable to the preparing, twisting, and spinning of hemp, flax, and other fibrous substances, and certain improvements in the mode of applying tar or other preservatives, to rope and other yarns,* Nov. 22.—This specification consists almost entirely of letters and figures of reference to the drawings annexed thereto, and which are indispensable to a clear description of theae improvements: we shall therefore aimply give the claims.

Claim first.—The general conatruction and arrangement of the varioua parts, whereby an inatrument is made effectual for the better treating of fibrous aubstances, during the drawing or straightening of the fibre, and reducing the aize or griat of the same; preventing the rising up of the ends of the fibre, and keeping the whole body compact during its passage through the gill teeth, and delivered to the level aurface of the mouth piece, which carriea it atraight till laid hold of by the draft rollers.

Claim second.—The delivery from the last pair of draft rollera (which usually deliver the fibre into a can, or, if to be twisted, on the flyer of a apindle,) into a tube, covered sufficiently to receive all the straggling fibres, as they may be delivered from the drawing rollers, and to gather them together into a compact round atate when about to receive the twist, and which twist it is preferable to give at the junction of another cove in the same tube, wi-

dened in the opposite direction from that by which the fibre entered. The point of junction of the two coves being the most contracted part of the tube, one half of the same being moveable so as to yield where the sliver is too thick for the opening, and passing the sliver thus through a narrow opening, gives the proper circular density, an essential requisite to form a good thread.

Claim third.—The polisher, consisting of two or more strands of felt or other such flexible substitutes, twisted together and held extended lengthwise by a spiral spring or other mechanical aid. The thread passes between these strands, and is firmly set together and then polished up.

Claim fourth.—The regulator roller, which going a little faster than the delivery blocks or rollers of the gilling head, puts a strain on the yarn during the spinning, and also prevents the uptaking motion of the bobbin from drawing it away irregularly.

Claim fifth.—The spinning the thread on a coned centre, or other middle piece, or uptaker, and the removing of the ends and centre of the bobbin, to enable the thread to be drawn off without the bobbin revolving; and from the interior; which being the same sense, in which the yarn is spun, obviates the necessity of running it against the fibre.

Claim sixth.—The manner of applying tar or other preservatives or moisture to the untwisted fibre, just before receiving the twist, and after it has passed the gill teeth or preparing machine.

Claim seventh.—The mode of steaming the hemp, or washing it, and the subsequent removal of the moisture, also the passing a current of dry air through the same.

NOTICE TO PATENTEES.

In accordance with the determination expressed in our last number to give Patentees *two months*' clear notice instead of *one month*, before the publication of their specifications, we now insert the names of the patentees, whose specifications will be published in the "INVENTORS' ADVOCATE," of February 6, 1841. Each party will receive, in addition, a private communication to the same effect.

William Jefferies, of Holme-street, Mile End, due Jan. 1.

Francis Todd, of Pindinnis Castle, Falmouth, gentleman, due Jan. 27.

Robert Irwin, of Durham, engineer, due Jan. 29.

John Swain Worth, of Manchester, merchant, due Jan. 29.

Alexander Angus Croll, of Brick-lane, due Jan. 29.

Joseph Bennett, of Turnlee, Derby, due Jan. 29.

John Louis Bachelard, of St. Martin's-lane, gentleman, due Jan. 30.

Felix Troubat, of Mark-lane, merchant, due Feb. 1.

William Daubney Holmes, of Lambeth-square, civil engineer, due Feb. 1.

Thomas Barnabas Daft, of Birmingham, gentleman, due Feb. 1.

James Taaffe, of Shaw-street, Dublin, builder, due Feb. 1.

FOREIGN PATENTS.—FRANCE.

(SECOND QUARTER OF 1839 CONCLUDED.)

101. Eude, N. F., 10 years, for *a process of preparing the warp threads in weaving*, May 22, 1839.

102. Fradel, L. L. H., 5 years, for *a new lace with open points or cotton tulle, resembling the open points of thread lace*, May 22, 1839.

103. Hallette, L. A. J., 10 years, for *a new high pressure steam-engine for draining mines*, May 22, 1839.

104. Levasseur, F. D., 10 years, for *a new mode of shutting up a shop from the inside*, May 22, 1839.

105. Maubland, G., 15 years, for *a machine to be used instead of steam or other motive power for stationary and other engines*, May 22, 1839.

106. Thivaud, J., 5 years, for *a medicine for a certain disease*, May 22, 1839.

107. Verneau, S. M. A., and Monroy, C. A., 10 years, for *a sugar-making apparatus*, May 22, 1839.

108. Barbeau, L., 5 years, for *a complete system of making coke, and of carbonising wood, of distilling from coal smoke sal ammoniac and essence of tar, and of obtaining from wood the pyroligneous acids forming acetate of lime, likewise essence of tar*, May 27, 1839.

109. Broche, M., 5 years, for *a primer for percussion guns*, May 27, 1839.

110. Buchanan, J., represented by Truffaut, addition to patent for 10 years, dated May 18, 1838, for *a new plan of spinning flax, hemp, and other fibrous substances, chiefly applicable to making rope yarn*, May 27, 1839.

111. Buchanan, J. C., represented by Perpigna, 15 years, for *improvements in the construction of railway and other carriages*, May 27, 1839.

112. Delaforge, E. C., 5 years, for *a forge blast with reservoir*, May 27, 1839.

113. Delaunay, A. H., 15 years, for *a new method of making carbonate of soda*, May 27, 1839.

114. Galay-Cazalat, A., addition to patent for 15 years, dated Aug. 24, 1838, for *new locomotive engines applicable to land and water transport*, May 27, 1839.

115. Goldenberg and Co., represented by Christmann, 10 years, for *improvements in rolled scythes*, May 27, 1839.

116. Baron d'Ingrande, A. L., 5 years, for *a lantern to be used on horse-back*, May 27, 1839.

117. Robertson, W. A., represented by Bloqué, 10 years, for *improvements in ships' capstans*, May 27, 1839.

118. Vivien Guerin, P., represented by Truffaut, 5 years, for *processes of waterproofing stuffs and rendering them impermeable to air*, May 27, 1839.

119. Beisson, J. H., 10 years, for *a filter for sugar refining*, June 3, 1839.

120. Beringer, B., fourth addition to patent for 10 years, dated Dec. 31, 1834, for *improvements on muskets loaded at the breech*, June 3, 1839.

121. Delaunay, A. H., 15 years, for *improvements in the construction of ovens and furnaces*, June 3, 1839.

122. Delaunay, A. H., 5 years, for *a system of economical combustion, produced by improvements in furnaces and fire-places generally*, June 3, 1839.

123. Marquis de la Rochejaquelein and Gache, addition to patent for 10 years, dated Nov. 16, 1836, for *a steam-engine worked at less than the ordinary temperature for working steam-engines*, June 3, 1839.

124. Fischer, F., 5 years, for *a musical instrument called piano-lyre*, June 3, 1839.

125. Gamelin, jun., P. P., 10 years, for *a machine for grinding dye-wood*, June 3, 1839.

126. Huet, A. J. L., addition to patent for 10 years, dated Jan. 31, 1839, for *a new movement applied to railway locomotives*, June 3. 1839.

127. Jolly, J. B. C., and Fournier, F., addition to patent for 15 years, dated Jan. 24, 1837, for *a new means of dyeing, redyeing, and preparing stuffs, particularly silks*, June 3, 1839.

128. Letestu, J. M., 5 years, for *balance-beds*, June 3, 1839.

129. Malka, J., and Arbib, S., 10 years, for *imitations of amber and coral*, June 3, 1839.

130. Radat, A., 5 years, for *turning to account the heat produced by the manufacture of coke, and for an improved extraction of pyroligneous acid*, June 3, 1839.

131. Roche, M. A., 5 years, for *a process for saving half the oil used in woollen factories*, June 3, 1839.

132. Roger and Co., 5 years, for *a mechanical lamp*, June 3, 1839.

133. Salmon and Co., represented by Fournel addition to patent for 15 years, dated Oct. 12, 1838, for *furnaces and apparatus for obtaining ammonia, bitumen, and hydrogen gas, in making coke, and of turning to account the disengaged caloric*, June 3, 1839.

134. Arrault and Sotteau, second addition to patent for 5 years, dated Feb. 19, 1839, for *an iron mosaic bitumen*, June 7, 1839.

135. Badin, J. T., 5 years, for *a new system of advertising*, June 7, 1839.

136. Barillot, J. M., and Savet, B., 10 years, for *improvements in the manufacture of velvet*, June 7, 1839.

137. Behrend, J. J., 5 years, for *an artificial stone to be used instead of lithographing stones*, June 7, 1839.

138. Boucher, P. L., represented by Raynaud, 5 years, for *a new apparatus for bleaching linen*, June 7, 1839.

139. Bryan Donkin and Co., represented by Truffaut, 10 years, for *an apparatus applicable to paper-making machines*, June 7, 1839.

140. Clostre, F., 5 years, for *a frame for weaving tresses of wool, cotton, or silk, in order to make thereof plain or party colored socks*, June 7, 1839.

141. Cornu, E. A., addition to patent for 10 years, dated March 22, 1838, for *machinery for increasing the power of steam or other engines*, June 7, 1839.

142. Craven, J., 5 years, for *a steam heat-exciter for increasing the intensity of flame in furnaces, for saving fuel, and for partly consuming smoke*, June 7, 1839.

143. De Gabriel, J. M. J., 10 years, for *new improvements in tulle machinery for producing imitations of dentelle-blonde*, June 7, 1839.

144. François Feuillet, L. E., 10 years, for *making tacks*, June 7, 1839.

145. Haumont, N., 10 years, for *a new moveable flooring*, June 7, 1839.

146. Kuhlmann, F., addition to patent for 15 years, dated Dec. 22, 1838, for *a new process of manufacturing sulphuric and other acids*, June 7, 1839.

147. Jules Maréchal and Co., third addition to patent for 15 years, dated Oct. 20, 1838, for *another means of retaining filtering substances in the interior of filters*, June 7, 1839.

148. Painparé, F., represented by Truffaut, 5 years, for *processes for making wine from sugar*, June 7, 1839.

149. Eugène Pavy and Co., addition to patent for 15 years, dated Nov. 4, 1833, for *new tissues*, June 7, 1839.

150. Piot, F. J. B., fifth addition to patent for 15 years, dated Oct. 25, 1833, for *processes applicable to one-rail railroads*, June 7, 1839.

151. De Rathen, A. B., 15 years, for *a new system of locomotion, and for the manufacture of an article essential to the application of this system*, June 7, 1839.

152. Rosiez, L., 10 years, for *a mechanical lamp*, June 7, 1839.

153. Verginaud, Jobert, and Guinaud, 15 years, for *re-preparing designs adapted to the Jacquard frame*, June 7, 1839.

154. Barbier and Daubré, addition to patent for 15 years, dated Oct. 23, 1838, for *new means of working and applying caoutchouc*, June 12, 1839.

155. Bartleet, W., represented by Perpigna, 15 years, for *improvements in needles, and in machines for making the same*, June 12, 1839.

156. Clerc, J., and Archbald, W. A., second addition to patent for 15 years, dated July 15, 1836, for *new means of refining sugar*, June 12, 1839.

157. Oberg, J. E., represented by Blunn, 15 years, for *a machine for manufacturing woollen and other cloths*, June 12, 1839.

158. Truffaut, L. H. J., 10 years, for *a method of cultivating and fertilising land*, June 12, 1839.

159. Chesneaux, A. F., 15 years, for *improvements in railway wagons*, June 15, 1839.

160. Guebhard, jun., P. F., represented by Reynaud, 15 years, for *a process of extracting from barrels staves, and empty casks, the spirits, oils, and other liquids or substances with which they are impregnated, serving also for cleansing and depriving them of any smell or color*, June 15, 1839.

161. Mesnard, E., addition to patent for 5 years, dated April 6, 1839, for *a new system of advertising*, June 15, 1839.

162. Perrot, L. J., eighth addition to patent for 15 years, dated Sept. 11, 1835, for *machines for printing paper and tissues*, June 15, 1839.

163. Sanderson, J., represented by Perpigna, 15 years, for *improvements in reducing iron ore*, June 15, 1839.

164. Barker, C. S., represented by Perpigna, 10 years, for *improvements in church organs*, June 20, 1839.

165. Blondin, F. H., 10 years, for *a couch with elastic bolster*, June 20, 1839.

166. Boquillon, N., 15 years, for *a system of apparatus and processes for regulating the flow of liquids and gases, for various means of avoiding the dangers arising from the compression of elastic fluids, and various processes of compressing, particularly adapted to the use of portable gas*, June 20, 1839.

167. De Cazenove, C. C., represented by Wilhelm, 10 years, for *the manufacture of copal varnish dissolved by pure alcohol*, June 20, 1839.

168. Espie, P. J., 5 years, for *a medicine for the affections of the air passages*, June 20, 1839.

169. Gemelle, F., 10 years, for *a lamp of increasing pressure*, June 20, 1839.

170. Guibout, A., Saint-Germain, M., and Christoffe, C., represented by Reynaud, addition to patent for 15 years, dated Jan. 27, 1838, for *the application of jewellers' work to making epaulets, shoulder-knots, &c.*, June 20, 1839.

171. Haley, J., represented by Perpigna, addition to patent for 15 years, dated May 11, 1839, for *improvements in apparatus for preparing the warp-threads*, June 22, 1839.

172. Lenoir, A. J., 5 years, for *a new portable press for making wine and cider*, June 22, 1839.

173. Gaudin, A. M. A., 15 years, for *a new system of lighting*, June 20, 1839.

174. Goldemberg and Co., 15 years, for *a new mode of making carpenters' tools, such as planes, chisels, &c.*, June 22, 1839.

175. Joumar, C. J., and J. B., 5 years, for *a new kettle for the purpose of preventing liquids from boiling over, particularly adapted to milk*, June 22, 1839.

176. Vigoureux, S., 5 years, for *a new screw-jack*, June 22, 1839.

177. Vigoureux, S., 5 years, for *a new method of drawing carriages*, June 22, 1839.

178. Tassin, J. B. C., and M., 5 years, for *new arrangements of metallic gauge fenders without hinges, applicable to apartment screens*, June 22, 1839.

179. Fayet, jun., 10 years, for *a hydro-locomotive engine*, June 26, 1839.

180. Alcan, M., and Péligot, E., 10 years, for *a new process of oiling and cleaning wool or woollen cloths*, June 26, 1839.

181. Baillie, B., represented by Perpigna, 10 years, for *an improved ventilator*, June 26, 1839.

182. Bellinger, Picard, G. F., 5 years, for *a new bolt for fastening doors and windows*, June 26, 1839.

183. Carlier, E. J. B. J., 5 years, for *machinery for making staves and cask heads*, June 26, 1839.

184. Catez, C. F. J., 10 years, for *a lamp, à niveau constant*, June 26, 1839.

185. Ferguson and Bornèque, 5 years, for *applying drums to mechanical weaving for obtaining figured tissues*, June 26, 1839.

186. Fisher, J., represented by Truffaut, 10 years, for *improvements in frames for making bobbinet*, June 26, 1839.

187. Baron d'Huart de Nothomb, H. J., 5 years, for *an oven for baking delf-ware*, June 26, 1839.

188. Irroy, S., third addition to patent for 15 years, dated Jan. 31, 1839, for *a heating apparatus*, June 26, 1839.

189. Salmon and Co., second addition to patent for 15 years, dated Oct. 12, 1838, for *furnaces and apparatus for obtaining ammonia, bitumen, and hydrogen gas in making coke, and of turning to account the disengaged caloric*, June 26, 1839.

190. Gemelle, F., addition to patent for 10 years, dated June 20, 1839, for *a lamp of increasing pressure*, June 26, 1839.

191. Callon, G. A., and Pauevels, L. A., 10 years, for *a mode of conveying excrements out of town, where there is a water-course; for apparatus for this purpose, and for the arrangement of the establishment for converting them into manure*, June 29, 1839.

192. Colin, P. J. G., represented by Perpigna, addition to patent for 15 years, dated May 6, 1839, for *improvements in sugar-moulds*, June 29, 1839.

193. Dailly, L., 5 years, for *an improved simplified lock*, June 29, 1839.

194. Jacquot, J. A., 5 years, for *a new game founded on geometrical combinations*, June 29, 1839.

195. De Lacoux, F. R., second addition to patent for 10 years, dated May 8, 1838, for *carriages that cannot be overturned, with new axle-tree*, June 29, 1839.

196. Leroy, J. J. J., 5 years, for *a new carriage and plough*, June 29, 1839.

197. Mangal, P. M., 10 years, for *a new lamp*, June 29, 1839.

198. Muller, M., and Coch, P., 5 years, for *a new means of applying the action of the wind, regulating itself spontaneously*, June 29, 1839.

199. Tachouzin, J. E., 5 years, for *a distilling apparatus, particularly applicable to distilling and purifying resinous substances for manufacturing essence of turpentine*, June 29, 1839.

FOREIGN INTELLIGENCE.

BELGIUM.

The *Journal de Limbourg* contains an account of the discovery of a valuable Flemish manuscript. M. Aerts, a painter and picture dealer at St. Trond, received in a house where he was at work 50 sheets of parchment to be made into glue. On discovering that they contained fragments of Flemish poetry, he asked for the remainder, which was willingly given him. Of course he had no longer any intention of converting them into glue; he showed them to M. Debrugh, professor of the College at St. Trond, who endeavored to put all the sheets in order. They were without folios or titles, and many of them were cut in two, both lengthway and breadthway. They contain the lives or legends of St. Lathgarde, and of St. Christine the Wonderful, translated from Thomas Contipratensis, by William, a monk of Afflighem, in the year 1260.

It is said that the steam-boat Louis-Philippe, which was built at Boom to work on the Scheldt, which has been for more than two years moored in the great harbour, is at length to be put into action. The difficulties which existed being removed, it is to be hoped that this steamer will in a short time be in operation from Antwerp to Tamise, and stop at the various intermediate stations.

The *Moniteur Industriel* states that the Duke of Orleans last week inspected the model of the machine invented by M. de Vilback, for the purpose of enabling railway carriages to run on curves without any difficulty. The model is on the scale of one to ten; or in other words it is a duplicate, on a small scale, of the apparatus with which experiments have two years ago been made by M. Vilback. The Prince examined this model with great attention, and expressed his approbation to the inventor. The Minister of Public Works, who was also present during this visit, expressed himself equally satisfied with the explanations given by M. Vilback. He led M. Vilback to hope that he would take the first opportunity of obtaining a definite decision on the important question of curves by general practical experiment, which alone can determine the merits of the best plan, whether theoretical or experimental. This would be the means of rendering an important service to railways. It is by tens of thousands that the saving would be computed consequent on the construction of railroads on a system proved by experience to be attended with no serious inconvenience, and which like that of M. Vilback would admit of travelling over all sorts of curves as rapidly as over straight lines, without danger, without any perceptible diminution of power, without any increase of price in the material, without any change in the arrangement and size of the rails and wagons, or in the mode of working.

It is said that among the articles of consumption on which the ministry intend to increase the duties, are tobacco, the fine wines of France, strong beer, coffee, &c.

RUSSIA.

RUSSIAN MERCANTILE SHIPPING.

The *Gazette d'Etat de Prusse*, in an article dated from St. Petersburgh, gives the following account of the preparations made by Russia, in the Black Sea, for the improvement of her commercial shipping interests:—

"The mercantile squadron on the Black Sea is already in a very respectable condition; it comprises at this time 222 merchantmen of various dimensions, built in the timber yards of Nicolajeff, of Odessa, Ismael, Cherton, Berisslawel, and Aleschka. In order to form suitable equipments for these vessels, in 1834, there was established, in all the towns bordering on the coasts of the Black Sea, commercial companies, which according to their regulations are authorised to admit individuals from all the free classes. During the time of their service they are exempt from every kind of personal service and from taxes.

"A certain number of them are always retained to serve five years in the navy, on the Black Sea, in order to give them an opportunity of learning their duties. At the present time there are nearly 4,000 individuals enlisted in these commercial associations; two hundred of them are engaged in the navy already mentioned.

"The formation of these associations of sailors will eventually have the greatest influence on our commercial navigation. It relieves us from the necessity of having recourse to foreign sailors; gradually supplies the deficiency of experienced men, which is still very sensibly felt, develops the germ of civilisation in our people, and opens to their activity a new branch of industry. The sailors in the navy of nearly all states possess resources in their merchant shipping which provide for almost all their wants.

" During the campaigns against Turkey, of 1828 and 1829, this squadron on the Black Sea was used for the transport of different articles required by our army in the field. It was this squadron which supplied the latter with provisions; it is, then, one of the most important establishments in case of war.

" This fleet is in a condition to take on board for transport at least 30,000 men, and more than 1,000 pieces of cannon, of calibres varying from 6 to 18 pounds.

" There has recently been founded at Cherton a school for young people of the middle class, who are intended for merchant navigation; twenty-four pupils are maintained there at the expense of government. During the last year fourteen pupils left the school, and were considered competent to enter on their profession. The value of this squadron of merchantmen is estimated at 3,284,365 roubles de banque."

RAILWAY INTELLIGENCE.
DOMESTIC AND FOREIGN.

Railway Communication with Scotland.—Lieutenant-Colonel Sir Frederic Smith and Professor Barlow, the commissioners appointed to investigate the best railway route to Scotland, have recently re-examined the lines between Lancaster and Carlisle, and we have reason to believe have reported in favor of the project, which takes in Kendal.—*Railway Times.*

The Eastern Counties.—The works on this railway, near Colchester, are progressing with vigor. At Widford a considerable excavation has been made in the Margaretting side of the hill, and an embankment is in the course of formation towards the river. The massive embankment leading from the river Chelmer towards New Street, Colchester (36 feet in height), proceeds steadily.—*Essex Standard.*

Experimental Trip on the Stockton and Hartlepool Railway.—On the 12th instant, this railway was opened to the coal trade. The day being remarkably fine, the directors determined upon making an experimental trip to Hartlepool on the occasion, but no other display or ceremony took place, as the directors intended to defer any public demonstration until the general opening of the line for passengers and merchandise, in the course of next month.

Raising Fares.—The Newcastle and North Shields Railway Company have raised their fares! There are now three different rates of charge: for the open truck the charge is sixpence each passenger—for the open carriage the fare, heretofore *sixpence*, is now *ninepence* (an increase of 50 per cent.—and for the best carriage the charge is as before, one shilling each passenger. To the poor man during the winter months, this change is a decided disadvantage—in the summer it will be comparatively little felt.—*Tyne Mercury.*

Railway Government.—Within the last few days the railway department of the Board of Trade has issued circulars to the various companies, enclosing four forms of returns to be made in pursuance of Lord Seymour's Act. Form No. 1, is to be made up to the 31st of December and the 30th of June in each year, and is to commence from the 1st of July of the present year. It comprises—description of passenger trains; number of trains of each class; average speed of each class, exclusive of stoppages; average speed of each class, including stoppages; number of passengers in each class; total mileage of each class; total number of miles travelled; average fare of each class per mile (particularising toll and locomotive power); and gross receipts from passengers. The same form contains also a return applicable severally to horses, carriages, and passengers' luggage, on which a charge is made; of the number of trains for conveyance; average speed, including stoppages; number and quantity conveyed; total mileage; charge per mile (specifying toll and locomotive power); and gross receipts. Form No. 2, is to be made up to the same periods as Form No. 1, and refers, under separate heads, to the conveyance of cattle, sheep, and pigs, specifying the number of trains for their conveyance; the average speed, including stoppages; the number and quantities conveyed (whether by the companies as carriers, or by other carriers); the total mileage of each; the average charge per mile (distinguishing toll and locomotive power); and the gross receipts. The same form has reference to the conveyance of goods of every description, enumerating and classing together those kinds for the conveyance of which different rates are charged. Form No. 3 is a "Return of accidents occurring in the course of the public traffic," and requires a notice of the names of the persons injured (stating whether passengers or servants of the company); the nature of the injury, the nature of the accident, the cause of the accident, and general remarks. This return is to be made within three days from the date of each accident, and, should death subsequently ensue, a second communication is to be made to the board, giving the substance of the evidence at the coroner's inquest, and the verdict returned. Form No. 4 requires a copy of all tables of tolls, rates, and charges affixed at toll-houses, specifying any past or future alteration, and also a copy of time tables, and notice of any alterations that may be made in the same from time to time. The particulars required in these forms will unquestionably be productive of much benefit. They will supply much useful statistical information for the future guidance of the companies.—*Railway Times.*

Calls on Railway Shares.—In the Court of Exchequer on Monday, Mr. Baron Parke delivered judgment in the case of the North of England Railway Company *v.* Biddulph. It was an action for calls upon 50 shares subscribed for by the defendant in the above undertaking, which was tried by Mr. Baron Rolfe, when a verdict was taken for the plaintiffs. A rule, however, was afterwards obtained on two grounds. The first was for arrest of judgment, for defect in the declaration, and, failing that, to reduce the verdict by the amount of the first call of £8, which was alleged to be defective by reason of the resolution, not specifying the place where and person to whom it should be paid by the proprietors. Mr. Baron Parke delivered judgment in favor of the plaintiffs. There was, he said, no necessity that the resolution embodying the call should contain the particulars contended for by the defendant. Such was the case with respect to the public notice of the call, and that obligation was complied with. The rule ought, therefore, to be discharged upon that point, as also upon that portion of it which went to arrest the judgment. It had been argued that the declaration was bad, because it was in debt on simple contract, whereas it ought to have been on specialty, and that, as the defendant was sued as a subscriber, it must be taken that he was liable in respect of the deed to the company. To this, however, there were two answers. In the first place, there was no such necessary conclusion, as the declaration followed the words of the act, throughout which there was no mention of any deed; while, in the second place, it must now be taken after verdict, that all had been properly proved, and that the jury had found for the plaintiff upon proof of the defendant's subscription to a deed. The rule, therefore, must be discharged on both points.

RAILWAY ACCIDENTS.

Accidents on the Great Western.—Two more accidents have occurred during the past week upon the line of the Great Western Railway. One was on Wednesday the 18th inst., when the 7 o'clock down train from Paddington, propelled by the Sunbeam engine, dashed with fearful violence against three empty trucks, which had been carelessly left on the line near the Kennet Wharf. The trucks were dashed to pieces, the engine and some carriages thrown off the line, and many passengers received serious bruises. It appears that a policeman in the employment of the company was sent forward to hold out a red light, as a signal for the engineer to stop the train. The engineer of the Sunbeam maintains that he never saw the red light, while the policeman equally stoutly asserts that it was exhibited in time to prevent the accident. Several of the directors of the company proceeded down the line the next day to investigate the cause of the collision, but the result of their inquiries has not been made known. The second accident occurred to one of the railway laborers, named Pointer, at work near Longcot, whose shoulder was severely fractured in consequence of his being knocked down by a down train as he was running across the line to escape from another train that was proceeding upwards to the terminus at Paddington.

Serious Accident from Inattention.—On Sunday morning a serious accident, though unattended with much personal injury, occurred to the first down train of the North Midland. It appeared that the heavy rain during the night had caused the embankment near Thurmaston to give way, and let down the rails several inches. The engine-driver, though cautioned to go along this part of the line at a slow rate, proceeded at the usual rapid speed, and no sooner got upon the sunken rails than the engine instantly went off them, and turned almost round upon the embankment, upsetting the tender, and completely breaking the next carriage, a second class, in which there was a woman and two children, and five other passengers, who escaped without any material injury, except from the shock, though thrown out of the carriage upon the embankment, where the upper part or covering of the vehicle was pitched before them, and was the only portion of it not shattered to pieces. The stoker had an equally fortunate escape; for when the tender turned over, he was forced under it, and thus escaped with a shock: slight bruises were received by several passengers. Some of the carriages, third-class among the number, did not go off the rails, *but the passengers of the latter, about fifty persons, were forced against each other with violence by the concussion.* The accident caused a delay of several hours to the train, in mending and clearing the line, and the loss from the total destruction of one carriage, and the injury done to the engine and tender, must amount to something considerable. The engine-driver having acted contrary to previous instruction, as respects speed across the spot in question, has, we understand, been suspended from his situation for some weeks, and fined £5.—*Leicester Chronicle.*

The Inquest at Selby, on the body of Mrs. Cousins, who was killed by the collision on the York and North Midland Railway, was adjourned four times. On Thursday the fourth day of the inquest, Watkins the engine-driver was examined. He said he supposed that some one must have been incautiously standing before the red light at the back of the train, which prevented him from seeing the signal. There was no break on the carriage where the guard was stationed. The Coroner in summing up, said, if the accident had occurred from wanton carelessness, inattention, idleness, or drunkenness, that man would have been criminally responsible to the laws of his country. But in this case that point, he thought, would not arise for their consideration. With respect to the other matter, that of a deodand, although the strict law as to deodands was this, that whatever is moving to the death of a party becomes forfeited to the Crown, yet it has invariably been an opinion which has guided the discretion of juries, and which seems to be sanctioned by the courts above, that according to the neglect or want of necessary caution should be the amount of the deodand laid. He said that this opinion appeared to be sanctioned by the courts above, because there had been a great number of cases in which juries had found trifling deodands upon very valuable things, which had been the moving cause of death; so much so, as not to bear any comparison to their real value. Applications had been made both on the part of the Crown, and also on the part of certain lords of the manor, to whom deodands have been assigned, to increase deodands, and the courts above have invariably refused to interfere to increase the deodands above

the finding of the jury. He therefore repeated, that the amount of the deodands was left entirely to the discretion of the jury. Necessary caution ought to be used, and would be used, by every man of honorable feelings, for the purpose of preserving the lives of passengers; but from the increased velocity with which carriages were propelled on railroads, they must invariably be attended with more danger than the common mode of travelling. —The room was cleared at half past 1 o'clock at noon. The jury remained locked up until 12 o'clock at night, when, becoming very violent with each other, some being for giving £10 deodand, and some £1,000, they were at length dismissed by the Coroner, who bound them over to appear before the judges at the assizes.

[During the day Colonel Sir F. Smith was on the railway, investigating the circumstances attending the late accident. The Marquis and Marchioness of Normanby passed along the line from York to London, having been at Mulgrave Castle, near Whitby, in the forenoon. His Lordship alighted at the junction, and entered into conversation on the subject with Sir F. Smith and Mr. Hudson, the chairman of the directors of the York and North Midland Railway.]

Fall of a Viaduct on the North Midland.—On Tuesday night, the 24th inst., three of the arches out of eight altogether, which carry the Midland Counties railway over a valley, a little to the north of Leicester, fell in with a tremendous crash. No train happened to be passing at the time, but the bags of the night mail were delayed in consequence. They were carried over the spot near to where the accident happened, and then forwarded from the other side of the broken line. By this accident all direct communication down this line, except as far as Leicester, must be stopped for the present, and the trade must go by Hampton in Arden to Derby, which route, however, fortunately is but little more either in point of distance, time, or expense. The canal, running under the line of arches, is at present choked up by the brickwork, but this obstruction will, no doubt, be soon cleared away.

Breaking of the Rope on the Blackwall Railway.—Some alarm was created among the passengers who started by the half-past eight o'clock train on Wednesday evening from the Blackwall terminus, in consequence of the breaking of the rope by which the train was propelled. The accident occurred soon after the train had started, and it was found necessary to transfer the passengers to another train running on the other line. The passengers were put to the inconvenience of a quarter of an hour's delay, and that was the extent of the mischief. The rope was repaired in the course of Wednesday evening, and on Thursday the trains were running as usual.

The Fatal Collision at Harrow.—The adjourned inquest on the bodies of Simpson the engineer, and Dawson the fireman, was resumed on Wednesday. Sir Frederick Smith was present, but the coroner (Mr. Wakley) said that considering the position Sir F. Smith held in relation to railways, he thought it would be better not to examine him. Sir F. Smith observed that after a perusal of the evidence, he thought it was impossible to add any thing more to the explanation of its occurrence. Several other witnesses were however examined. Mr. Creed, the secretary to the London and Birmingham Railway Company, read the following regulations, which have been adopted, or recommended for adoption, since the 12th Nov. :—

"1. Engines, in all cases, whether acting as pilots, or having gone out as assistants to trains, to carry tail-lamps.

"2. Weights of all loaded wagons to be ascertained by weighing machines, on coming upon the London and Birmingham Railway, and the necessary number of machines to be ordered.

"3 The luggage trains to work to a time table, and the times of arrival at the respective stations to be observed and reported, whether stopping at such stations, or only passing through.

"4. For carrying out the foregoing suggestion (3), the number of wagons in each luggage-train to be limited.

"5. Wagons found by the weighing-machine to exceed the regulated load not to be permitted to go with the train.

"6. Mr. Bury, as superintendent of locomotive machinery, to examine and report on the state of the wagon wheels and axles, and immediate provisions to be made for replacing all that are in any way defective.

"7. All parties supplying wheels and axles, or other iron work for the carriages or wagons, to send a declaration of the particular manufacture of the iron which they have used.

"8. Clause 195 of the Act of Incorporation, with reference to the approval of carriages coming on the London and Birmingham line, to be strictly enforced as in the case of clause 196.

"9. The police and station clerks to report as to the state of the tail-light of every train, whether luggage, passenger, or ballast.

"10. The pneumatic signal apparatus to be applied to the tunnels, and to such of the stations on the line as from local circumstances may require it.

"11. Lodgings to be provided for the station clerks and servants of the company at the stations on the line, that their services may be at all times available."

The inquest was again adjourned till Wednesday next, for the purpose of having the evidence of the stoker of Simpson's engine, who is at present not sufficiently recovered from the injuries he sustained to be examined.

Precautions against Railway Accidents.—A precaution is used on the North Midland Railway, which, if it were used on all other railways, would prevent many accidents to life and property. During the night a green light burns at 400 yards on each side of every station; and the engine-driver has strict orders always to shut off his steam on arriving at the green light, so as to pass the station slowly, and not to turn on the steam again till he has passed the second green light. He is thus in a position to stop the train, if any thing should occur to make it desirable, within a very short distance. We understand that Mr. Robert Stephenson, the engineer, is preparing a contrivance for attaching a self-acting break to the buffers of every carriage: this would act by the break being applied to the wheel, as soon as the buffers of any two carriages came together. In cases either of accident or of danger, as soon as the engine-driver turns off the steam, the buffers of the carriages come together; but unless breaks are instantly applied, the momentum of the train carries it a considerable distance before it can be stopped. If, then, a break were instantly and infallibly applied to every carriage as soon as the steam was turned off or any check experienced, (such as the engine getting off the rails,) the whole train would be at once converted into one long *sledge*, and the friction off the rails would bring it to a stand in much less time than is now possible. It seems to us, therefore, that such a contrivance as we have mentioned will be one of the most valuable improvements that can be adopted on railways. A correspondent makes a good suggestion for preventing accidents during the night or in foggy weather; he says that every watchman or policeman should have the means of conveying his warning to the *ear* as well as to the eye of the engine-driver, for which purpose he recommends that he should be provided with a large *bell*. By such means of giving the signal of danger, the last collision on the London and Birmingham Railway, (where the watchman gave a signal to the eye, which the engine-driver did not see,) might have been prevented. We may offer a suggestion of our own, namely, whether a light but firmly built carriage, loaded with some elastic material, as wool or hay or containing a series of strong springs, might not with great advantage be attached at the rear of each train, as well as in front of each locomotive engine, with the view of *breaking the force* of any collision It is known that woolpacks will even destroy the force of a cannon-ball.—*Leeds Mercury.*

FOREIGN RAILWAYS.

RAILROAD BETWEEN THE SAMBRE AND THE MEUSE.

We learn that the commissioners of the railroad from the Sambre to the Meuse have sent to the Minister of Public Works the 6th and last part of the survey of this road. The length of the railway on the principal road is 12,245 metres 99c. ; if to which be added the stations and the turn-off rails it forms a total extent of 17,642 metres 79c. The incline is three millimetres. The engineering difficulties consist of a tunnel at Dourbes of 454 metres 13c. long; of another tunnel at Molhain, under the boundaries of the kingdoms of Belgium and France, of 195 metres long, preceded by a cutting of 370 metres through the schist, the depth of which will be about 18 metres. There is a bridge of 24 metres; four bridges of 20 metres each; two others of 16 metres; one of 14 metres; two of 10 metres; one of 8 metres; a viaduct to carry the railroad under a road; 15 small aqua-ducts of various dimensions; and lastly of a large basin communicating with the Meuse, 410 metres in length, and 26 metres in breadth, surrounded by railroads for wagons, that the coals may be conveyed into the vessels without other manual labor than opening the backs of the wagons.

Among the works on land, besides a second excavation opposite the village of Treignes, the Viroin, a river of considerable size, has been turned for a distance of 2,350 metres, the breadth of the channel being on an average 16 metres.

The plans are made on the scale of one to 2,000 Those on the road from Strasburgh to Bâle are on a scale of one to 2,500; and those on the road from Paris to Orleans are only reported to be on the scale of from one to 5,000.

The plans which have been sent to the Minister of Public Works complete the useful labors undertaken by the commissioners. It is the third survey they have sent since the dissolution of the general company. Since that time in the midst of the crisis, their labors have been increasing. They have ascertained the engineering difficulties, finished the definitive plans, made arrangements with the proprietors of lands, investigated the products, printed memoirs, geographical and geological maps, all of which has been in operation at once; and it is without any assistance, entirely by their own resources, that the commissioners have for two years paid 80,000 frs., to pursue the great work they have undertaken.

M. Massie, director of the railways now in operation in Belgium, returned recently from the tour he has been making in Germany and France. It is said that during his researches he has collected much valuable information on the method of improving and simplifying the railroads in Belgium.

Spanish Railroad.—A letter from Oviedo, in Spain, states that a splendid railroad from Sama to Gijon (about sixteen miles) is being made, in virtue of an agreement between the Government and M. Aguado. More than 1,500 workmen are continually employed upon it. This road is through a country at an elevation of 2,000 feet above the sea. The coal mine of M. Aguado is near Sama. It is worked by a Belgian engineer, and will, it is supposed, in a few months yield 2,000 quintals per day.

Notwithstanding the unfavorable weather, which has continued almost two months, the works and embankments in progress on the railroads between Tubise and Soignies, advance with inconceivable rapidity. The part from Tubise to Hennuyères is on the point of being finished; that from Hennuyères to Bruine le Comte, in which there is a tunnel 450 metres in length, will, it is asserted, be finished in May 1841; so that it may be hoped that this part of the railroad from Brussels to Luievrain, the only part which presents great difficulties, will not retard its being opened in Sept. 1841, from Tubise to Soignies.

Shooting Stars.—Shooting stars and meteors differ from aerolites, in several respects. They burst from the clear azure sky, and darting along the heavens are extinguished without leaving any residuum, except a vapor like smoke, and generally without noise. Their parallax shows them to be very high in the atmosphere, sometimes even beyond its supposed limit, and the direction of their motion is for the most part diametrically opposite to the motion of the earth in its plane. The astonishing multitude of shooting stars that have appeared within these few years at stated periods over the American Continent, and other parts of the globe, warrant the conclusion that there is either a nebula, or that there are myriads of bodies revolving in groups around the sun, which only become visible when inflamed by entering our atmosphere.—*Dr. Humble's Dict. Geol. and Min.*

WELLINGTON STATUE IN THE CITY.—Sir Francis Chantrey has contracted to complete the equestrian statue in bronze of His Grace the Duke of Wellington, by the month of June, 1843. It is understood that the site has not as yet been finally determined on, but it is supposed that it will be in one of the new streets near the Bank.

GENERAL COMMISSION AND PATENT AGENCY FOR IRELAND.

WE beg to recommend our AGENT for IRELAND, Mr. RICHARD TELFORD, 109, STEPHEN'S GREEN, DUBLIN, as the most eligible person whom PATENTEES can employ for the sale of their articles in Ireland. He has a most extensive and respectable connection, and his house is well known as a depôt for patent goods, inventions, &c. We have no doubt of his efficiency to promote the interest of those parties who may favor him with their business.

Mr. TELFORD also undertakes every description of Patent Agency business for Ireland.

TO CORRESPONDENTS.

We wish Mr. W. Williams *had sent his communication in a form for publication, as we scarcely know what notice he requires to be taken of his letter. Our columns are open to him to deny that the two inventions are similar in principle, and to explain the difference.*

We are obliged by the communication from "Kennington Oval," *but the numerous ingenious contrivances therein described, having been before the public for several years, cannot be now noticed among new inventions.*

GRATUITOUS COPIES *of our Journal have been forwarded to a number of Individuals interested in some Patent or Invention, of which notice has been taken in our number of to-day.*

"THE INVENTORS' ADVOCATE" *is published every* SATURDAY MORNING, *at* 7 O'CLOCK; and is regularly issued in MONTHLY PARTS, of which 1 *to* 17 ARE NOW READY.

"THE INVENTORS' ADVOCATE" is also published in Volumes containing the Nos. of every 6 months.

Vols. 1 and 2, handsomely bound, are already published.

TO INVENTORS.

PERSONS WHO WISH TO OBTAIN OR DISPOSE OF PATENTS, *or to bring* NEW INVENTIONS INTO USE, *are requested to apply to the* PATENT OFFICE, BRITISH and FOREIGN, No. 198, STRAND, *opposite St. Clement's Church, where they will meet with great facilities to obtain information and to carry out their views.*

THE GALLERY OF INVENTIONS,

Attached to the Patent Office, is a spacious Saloon, well lighted, in which Plans and Models are exhibited. It affords an excellent medium for bringing New Inventions into public notice.

TO CAPITALISTS, MANUFACTURERS, AND TRADERS.

Among many VALUABLE INVENTIONS *and* PATENTS *registered at the* PATENT OFFICE, BRITISH and FOREIGN, (198, STRAND), *for the investment of capital, Shares are offered for sale in the following Useful Inventions:—*

A Fire Escape of Novel Construction, which may be used as an Observatory.
A Cheap Lamp for burning Tallow and Grease, without overflow or smell.
Patent Screw Jack, for lifting locomotives and other great weights.
An Improved Balance, applicable to small or great weights.
Important Improvement in Wood Paving.
A New and Improved Method of Burning Coke.
New Methods of Purifying and Treating Oils.
A new System of Clock-making.
Patent Forge Back.
A new Castor for Furniture.
Patent Process for the Manufacture of Soda.
Improved Methods of Building Iron Ships.
The Purification of Gas.
Improvements in Soap-making.
An Umbrella, in imitation of a Malacca Cane.

THE INVENTORS' ADVOCATE,

AND

JOURNAL OF INDUSTRY.

SATURDAY, NOVEMBER 28, 1840.

*** *The Office for the publication of* THE INVENTORS' ADVOCATE, *is removed from Tavistock Street, Covent Garden, to the Patent Office, British and Foreign,* 198, *Strand; opposite St. Clement's Church.*

We shall not cease to point out and inveigh against the defects and injustice of the present patent laws until some remedy has been applied for the numerous hardships they at present impose upon inventors. The very first step taken by an inventor, when he wishes to secure the exclusive property of his ingenuity by a patent, involves him, most probably, in expenses and useless litigation for which there can be no other possible reason than that it affords an opportunity of exacting additional fees. The inventor first enters a caveat in the Attorney-General's office; which caveat is merely the title of his invention. The object of this proceeding is, that the inventor may receive notice in case application for a patent for any other invention of the same kind should be made before the first patent is sealed. Should the object about to be patented be some improvement on articles in general use, it generally happens that some other application for a patent on the same subject is made. The Attorney-General in that case gives notice to the person who entered the caveat, and he has the option of being heard before that officer against the second applicant. The inventor must then explain the nature of his invention to the Attorney-General, before whom the other party also explains his. If the two inventions be the same, or nearly the same, the last applicant for a patent is stopped from proceeding further. The successful opponent has, however, the fees of office to pay, and he cannot go through this ordeal at a less cost than three guineas and a half for fees only. It sometimes happens that the applicant for a patent will have to go before the Attorney-General three or four times to contend against competing inventions. The expense of these oppositions becomes a question of serious moment to many industrious and ingenious men, who, rather than incur it, frequently run the risk of leaving the competing claimant unopposed, on the chance of the invention not proving to be the same.

All this annoyance, anxiety, and expense might be obviated, if the applicant for a caveat were required to lodge a sealed description of his invention with the Attorney-General; who, when any other applicant appeared, whose invention from its title appeared to clash with the former one, could examine and compare the two descriptions, without requiring the attendance of the parties or the arguments of counsel. This, however, would be attended with a loss of fees, therefore reason, and justice, and common sense must succumb.

Another evil attending the incipient process for obtaining a patent is, the veto which the law officers of the Crown possess. Should it seem to them that an invention is in part the same as some other invention of a similar kind, or if it be in their opinion not the proper object for a patent, it rests with them to deny the grant. The inventor has no appeal from their decision. The study and labor of months or years may be thus rendered of no avail by the dictum of an officer who has probably a very imperfect knowledge of the subject on which he decides. A legal education affords but little insight into the mysteries of art and science. We have known barristers who made a boast of their ignorance of all matters connected with science, and treated them as beneath consideration. Fortunately, the present holders of the offices of Attorney and Solicitor General have more sense than to boast of ignorance of the most important branches of knowledge, and they have, we believe, as much acquaintance with mechanical science as would, in ordinary cases, enable them to judge of the merits of competing inventions, if they bestowed time and attention to the subject. But the question is, whether any one man—especially one who is not adapted by his education and pursuits to form an accurate opinion—should be vested with the absolute veto on the claims of inventors.

The law protects with rigorous nicety the right to property of more questionable tenure, but seems to place obstructions in the way to acquiring the indisputable natural right which every man possesses to the produce of his own invention.

THE PHILOSOPHY OF SHOP LIGHTING.

The plan adopted for lighting shops was, until within two or three years, the most absurd and unphilosophical that could well be contrived. Even now, it is only in the principal streets in London that reason and common sense have been triumphant in this matter, and still in the greatest thoroughfares do we frequently find the old mode adhered to. The former plan was to arrange a number of brilliant lights on a level with, or below, the eyes of the spectators; so that the dazzling effect, though good as an illumination, prevented the goods in the shop-windows from being seen. It might be supposed that the object of this plan was to hide the defects of the goods exposed, instead of to display their beauties. Yet such a hold had habit obtained, that even when the immense improvement was shown of a different arrangement of the light, shopkeepers were reluctant to make a change which seemed to detract from the brilliancy of their night display.

The absurdity of this system at length forced itself on the mind of some bold innovator; who, reflecting that the articles exhibited were the things intended to be seen, and not the light, which was only employed to make them visible, he contrived the plan of shading the light from view, and per-

mitting its rays to come reflected only from the goods. The great improvement of this mode was immediately perceived, and various modes were contrived for producing this new effect. In some shops, lanterns have been placed outside the windows, having gas burners and reflectors within; but this gives the shop-front an unsightly appearance, which is not compensated by the effect produced. Others again, have adopted ground glass shades over the gas burners. This, indeed, diminishes the glare of light, but it, at the same time, reduces its quantity, and produces a great waste of light inside the ground glass globe. Another plan has been, to place reflector-shades before the gas burners. The disadvantage of this arrangement is, that it produces a disagreeable shadow in the street, and disfigures the window. The simplest and most pleasing disposition of the light is to elevate it high above the eyes of the passengers. By this means the rays are diffused generally over the articles in the window, which reflect their several hues to the eyes of the spectators, undiminished by any offensive glare or sudden contrast, and contribute to produce the most pleasing effect. There is an exception to the rule to be observed in the shops of those who sell light, or the materials from which it is produced. In their cases, as the production of light is the main feature of their business, their lamps may very properly be made as conspicuous and brilliant as possible. The philosophy of shop-lighting, in short, is this, that the articles offered for sale should be made prominent, and shown to the best advantage, whilst the means by which they are displayed should be invisible.

RAILWAY ACCIDENTS.

FROM A CORRESPONDENT.

Next to the prevention of accidents on Railways, the means of protecting passengers from the frightful consequences of collision demand the most earnest attention. The terrible sacrifice of life, and mutilation of the person which have resulted from the accidents of the last two or three weeks, lead one to inquire if no means can be devised to protect passengers from such calamities. In seeking for a remedy to an evil, we must look not only at the cause which produces it, but at the manner in which it is brought about. When a railway collision takes place, the passengers on one side of a carriage, are, by the suddenness of the shock, thrown with tremendous momentum against the other side, and in this way occur those horrible results of which we see such heart-rending accounts in the newspapers. In the published reports, we read of fractured skulls, broken limbs, and faces horribly mutilated by the force with which passengers are thrown against each other, or against projecting parts of the interior of the carriage. We remember one account of a lady who was riding in her own chariot on a truck, when by the sudden shock of a collision, her face was dashed through the window, and dreadfully cut and disfigured by the broken glass; and the young woman who died at the London station of the Southampton Railway was bereft of life in a moment by the violence with which she was thrown from her seat to the opposite side of the carriage. We have carefully examined into all the cases of fatal Railway accidents, and we find that the loss of life and injury to the passengers have been almost invariably produced in a similar way. Nor is this to be wondered at, when we consider that the immediate effect of the collision of railway trains, propelled at their ordinary speed, is to project the bodies of human beings, weighing 150 to 200 lbs. or upwards, with the frightful velocity of 30 to 40 miles an hour against each other, or against hard substances. The only wonder is, when accidents occur, that the loss of life is not greater.

From a consideration of the subject in this point of view, and with an earnest desire to afford security to the public, we have thought of a very simple contrivance, which in the case we have alluded to would be an effectual safe-guard against injury to the person. Our plan is nothing more than attaching every passenger to his place by a strap or band, made fast to the back of the seat, to be secured by a buckle round his waist. At first sight there appears something ludicrous in the idea of strapping a person to his place, but we are quite sure that, when the public got used to it, and found that in cases of accidents those persons who took the precaution of thus protecting themselves escaped unhurt, the ridicule of the plan would pass away, and every body would quietly fall into it. The mode of applying what we should term the *safety bell*, would be to attach a broad band made of some strong and elastic material, (we should recommend caoutchouc web,) by its middle to the back of each seat, with a buckle at one end and a thong at the other, the two ends being of sufficient length, and placed at a convenient height to enable each passenger to buckle them loosely round his waist.

The effect of this precautionary measure, should a collision take place, is obvious. The passengers instead of being thrown forward with the shock, will be kept in their places by the band, and preserved from the terrible consequences to their persons should an accident occur. We cannot help thinking that the suggestion we have thrown out deserves to be taken into consideration, and will say, for our own part, that if we were travelling by a railway train with a safety belt round our person, and our opposite fellow passenger secured in a similar way, we should have a sense of security which we do not now feel, when we are hurried along with frightful speed, and know we might be dashed to instant death if we were thrown from our seat with the velocity at which we are moving.

D.

NEW INVENTIONS.

PORTABLE BOAT.

The Duke of Orleans, the French Minister of Public Works, and other gentlemen, last week, were present at a trial made with a portable boat. The King of the French had permitted M. Leclerc, the inventor, to make the experiment in the Parc de Monceaux. The boat with which the experiments were made weighs only 200 kilogrammes, about 450 lbs. It was launched with ease by four men. A detachment of forty-three soldiers, with arms and baggage, and some sailors, embarked on it. The boat moved like any other vessel of the same form, but of course with less draft of water, because it is much lighter. The boat was lifted from the water without difficulty, completely taken to pieces and put into a box made of part of the boat itself, the box was two metres long, seventy centimetres broad, and ninety centimetres high. This manœuvre was accomplished in about twenty-one minutes; it takes nearly the same time to put the boat together again. This vessel has taken many voyages laden with from twenty-eight to thirty-five large casks filled with water; when laden it was exposed on the Seine to a violent storm, and it was put up and taken to pieces four times without sustaining any injury. This invention is particularly advantageous on all rivers where there is little water, especially where the return up the stream is difficult and expensive. For example it costs 500f for the passage of a boat from Paris to Auxerres, or 7,000 for 15 boats. M. Leclerc would take fourteen of his boats to pieces, and load the fifteenth with them, and would gain 7,000f. each voyage by this operation. These boats drawing so little water, might on many occasions be used instead of timber rafts, which are so expensive on account of the liability to loss and injury the wood sustains, and the necessity of washing it afterwards.—*Moniteur Industriel.*

CAST IRON TILES.

The *Memorial de la Sambre* announces that a trial has just been made in the manufactories of Gougnies, to substitute plates of cast iron for slates and tiles. In these first specimens seventeen plates of cast iron of a certain shape cover a square metre, and this square metre weighs on an average 22 kilogrammes. The same extent covered by common slates weighs 21 kil., and by large slates 19 kil., and the square metre of tiles weighs 40 kilogrammes. Thus, on the ground of lightness alone, cast iron plates may bear competition with slates, and they have a decided superiority over tiles. The plates of cast iron are sold at the establishment of Gougnies at 30 centimes a piece; two centimes more when they are required to be varnished, to protect them from the wet. The value of the plates therefore is 5 francs 10 centimes the square metre, and varnished plates 5 francs 44 centimes. The price of these cast iron plates is therefore not exorbitant, particularly when it is considered that the use of plates of cast iron prevents the annual expense of repairing, which in roofs of slate or tiles averages a quarter, and sometimes a third of the first cost. Besides, there is a saving of the nails, which are used to join the slates. The iron plates are fixed merely by wooden lathes.

It is expected that this new invention will be of great service to the iron manufacturers: many other applications of iron it is expected will result from this.

ELECTRO MAGNETISM APPLIED TO RAILWAYS.

The Rev. Professor M'Gauley, whose scientific experiments in electro-magnetism excited so much notice in the philosophic world some time ago, has communicated to some of the principal railway companies in England a valuable invention, which will be attended with most important results in the preservation of life and property from almost all the casualties to which they are at present subjected in railway travelling. His object is to render the stoppage of the train entirely independent of the engine conductors; so that, should they, as was lately the case, fall asleep, get drunk, or otherwise become incapacitated for the discharge of their responsible duties, the steam can be turned off, and the train stopped, totally independent of them. The simple announcement of the object of Mr. M'Gauley's invention is sufficient to render its vast importance obvious to every man who has bestowed one moment's thought upon the subject. We have been favored with an examination of the invention, and consider it at once simple, ingenious, and admirably adapted to effect the desired end; its cost is trifling. This important improvement has been submitted to the directors of some of the first lines of railway in England, and to the Dublin and Kingstown and Ulster railway companies, who are giving it their best consideration, and, we presume, will test its utility by experiment.—*Dublin Monitor.*

IMPROVEMENT IN MAKING GUNPOWDER.

Mr. Mayer, mining superintendent at Gengenback, in the Duchy of Baden, has discovered that colophonium (resin) mixed with gunpowder in the proportion of one ounce to a pound, doubles the strength of the powder, so that in blasting one ounce may be used instead of two, and with greater effect. The gunpowder and resin should be intimately blended. Mr. Mayer made this discovery accidentally from putting a piece of paper, on which there happened to be some sealing wax, into his gun, as wadding, when, on his firing the gun, the effect being as if he had used a double charge, he was knocked down by the recoil. This he imputed to the resin.

IMPROVEMENTS IN METALLURGY.

The present age is rife with improvements in metallurgy, and science is effecting that which some few years since would have been scoffed at as theoretical notions, not worthy of attention. We have witnessed the vast improvements which have been made in the smelting of iron ores, and we have now before us the results of chemical and metallurgical operations in the manufacture of sulphuric acid, of zinc, and the extraction of silver from the gossans, which so plentifully abound in Cornwall, and from the crude metal. The general use of mundic, or, as better known in Ireland, the sulphur ores, affords the means of subsistence to thousands, by the working of otherwise unproductive mines, to the exclusion of foreign sulphur. In the manufacture of zinc we find that two-thirds less fuel are now consumed than under the old process, with a saving in the like ratio of labor, while a greater produce is obtained from the ores; and patents are now being prosecuted for the extraction of silver, which is more or less found in combination with lead and copper. Letters are now before us from some of the most eminent houses in the north and other districts, on the subject of the use of sulphur ores, from which it is gratifying to learn that, with hardly an exception, the use of Sicilian sulphur is exploded, to the advantage of the manufacturer and the British miner.—*Mining Review.*

NEW PLOUGH.

Joseph Herbert, an ingenious mechanic at Crosscannonby, in Cumberland, has lately constructed a plough on a new and improved principle, performing double the work of the common plough, by turning up two furrows at once. An experimental trial was made on the farm of Mrs. Hodgson, Allerby Hall, on the 24th October, and the success of the new plough surpassed the expectations of the most sanguine. It is a light and easy draught for three horses; and the builder is now confident that by some trifling alteration in the machinery, he can render it equally safe for two horses on most lands. —*Carlisle Journal.*

VAUCHER'S PATENT PUMPS.

The *Glasgow Courier* of the 17th inst. gives the following account of a trial recently made there of these newly invented pumps:—Yesterday experiments were made of this machine in the Police Square, in presence of the Commissioners, the Captain of Police, Mr. Robertson, Superintendent of Fire Engines, and several engineers and scientific gentlemen. The experiments were highly successful, and demonstrated, according to anticipation, that the machine is admirably adapted for use in various ways, as lifting or force pumps, on board of ships, in public and private buildings, and in engineering and mining operations. The object of the Commissioners was, we are given to understand, to ascertain whether it might be used with advantage in extinguishing fires, and the feeling expressed by those who witnessed the experiment was highly favorable to the invention. The machinery is exceedingly simple. It consists of a horizontal cylinder, in which works a piston in a semicircular motion given to it by means of hand levers which are attached to the extremity of the piston's axis. The whole is placed in a tub resembling a small churn, and the levers are moved by two men with great facility. The water was, by means of this machine, propelled a considerable height above the police buildings. One of the police engines was put in operation. It discharged a greater body of water and to a greater height, but it required twelve men to work it. M. Vaucher was present, and produced a number of certificates from large manufacturing and engineering establishments in England, in which the machine has been used with great success.

LECTURES ON THE COMBUSTION OF COAL AND THE PREVENTION OF SMOKE.

Mr. Williams gave his second lecture at the Scientific Institution, Liverpool, on Friday. He observed, that, at their previous meeting, having considered the alphabet and grammar of combustion, he had now to describe its language and practical application; in other words, the combustion of the gaseous matter on the large scale of the furnace. He had ascertained that the quantity of air required for the evolved gas was, on the lowest scale, for carburetted hydrogen, ten times the volume or bulk of the gas to be burned: the first consideration was the mode of bringing these two disproportioned masses together with that degree of mixture which had already been shown to be essential to complete and effective combustion. The mode of effecting this mixture was to be looked for in the laws which governed the diffusion of gaseous bodies, and which was found to be essentially different from that which affected liquids. In the latter, the laws of gravity are found to operate; the lighter liquids remaining on the surface of the heavier ones. In the case of gaseous bodies, the case was essentially different: gravity and the influence of specific densities, in such bodies, being found to be neutralised: the heavier gases ascending, and the lighter ones descending, until an equilibrium was attained and perfect diffusion established, as each gas might be said to fill the space to which it was confined, notwithstanding the presence of others; in the language of Dalton, to whom we are indebted for the first notice on this head, each gas acting the part of a vacuum to the rest.

An essential condition, however, of this diffusion is, that time is required. In looking to the admixture of the large volume of gaseous matter, as evolved from the coal in the furnace, the question naturally arose, how was this time to be obtained? The gas, as fast as generated, was carried rapidly away into the flues, and the due time was hence unattainable. The want of the necessary time was, therefore, the great evil of the furnace. In this consisted the main differences between the combustion of gaseous bodies on the small scale of the laboratory, and the large one of the furnaces. To compensate this want of time was, in truth, the great object of the inquiry, so as to obtain the necessary diffusion of the large volume of atmospheric air with the small volume of gas to be ignited. Now, the neglect of this feature, and even of the other condition, namely, quantity, could not fail of being observed by all who looked to the circumstances of air furnaces as ordinarily constructed. In truth, the whole question, as far as regards any practicable improvement or approach to perfect combustion, was a question of the condition on which air was to be administered; yet that was precisely the point least attended to in practice, and least understood. The lecturer gave several proofs of this inattention, and, by means of illustrative diagrams, explained the consequence of failing to effect the necessary diffusion. He also showed how, when the air was duly applied, even the most intractable and impure oils may be made to give out the purest light. This view of the question was illustrated by means of two small lamps; the one charged with good oil, and the other with the worst description, namely, the heavy oil from the coal tar, and which, from its great impurity, sinks when brought into contact with water. Mr. Williams, by means alone of adjusting the admission of air in the right place and right quantity, produced a brilliant white light, giving no smoke, from this impure oil; and yet, by the smallest change in those conditions as to the air, this white, clear light was converted into a dark and obscure flame, emitting a body of smoke, and even heavy soot, in large flakes or ropes.

Mr. Williams then explained the important feature of the generation of carbonic oxide in the furnace, pointing out the chemical difference between acids and oxides, and their direct application to the case of the combustion of coal. He showed that, by the conversion of carbonic acid into the oxide, not only was a large quantity of carbon lost to the furnace, but a considerable effect produced on the draught, by doubling at once the bulk of the products of combustion. He also pointed to the error into which we naturally fell, by supposing the whole carbonaceous matter was consumed when we saw no black smoke appearing from the chimney; whereas, in fact, we were often merely generating this carbonic oxide, by which we sacrificed much of the valuable combustible, but which being a transparent gas deceived us into the idea that the smoke was burned.

Mr. Williams then forcibly exposed the errors of the present practice of calculating the quantity of surface-bars on which the fuel was to be consumed, while the real essential, the quantity of air to be admitted to that fuel, was wholly overlooked; observing that, so long as we gave precise rules and dimensions for matters of no importance, and wholly omitted all directions as to what really was essential, as had been done with all the affectation of algebraic formulæ by Mr. Armstrong, of Manchester, it is in vain that we seek for economy in the use of fuel. Mr. Williams quoted from Mr. Armstrong's book, and showed the errors on which he had proceeded, leading the mechanical engineer astray by empirical rules, and, under the abused name of practice, palming on the public the veriest imaginable theories and absurdities, without any rational or sound principle, based on the *ipse dixit* of some ignorant working bricklayer, who, having done this or that, and found them to be best, dignified his own errors with the name of practical truth.

Mr. Williams described, at some length, the importance of attending to the quantity of the air admitted to the furnace, and the total neglect of this essential in practice, and concluded a lecture of nearly two hours' duration to the apparent satisfaction of his auditory.

THE PERCUSSIVE ACTION OF STEAM.

At a recent meeting of the Institution of Civil Engineers, a paper by Mr. Josiah Parkes was read "On the Action of Steam as a Moving Power in the Cornish Single Pumping Engine," the object of which is to prove that the power gained in engines working expansively is to be attributed partly to the percussive power of the steam on its admission into the cylinder. In this paper Mr. Parkes presents a detailed analysis of some of the facts collected and recorded by him in his former communications, with the special object of ascertaining from the known consumption of water as steam, the whole quantity of action developed—the quantity of action had it been used unexpansively—the value of expansion—the correspondence between the power, and the resistance overcome—with a view of determining the real causes of the economy of the Cornish single pumping engine. The data employed for the purposes of this investigation are those obtained from the Huel Towan engine by Mr. Henwood, from the Holmbush by Mr. Wicksteed, and from the Fowey Consols. Steam may be applied in one or other of the two following modes: expansively, that is, when admitted into the cylinder at a pressure greater than the resistance, and quitting it at a pressure less than the resistance; or unexpansively, that is, when its pressure on the piston is equal to the resistance throughout the stroke. By the term *economy* in the use of steam, is meant the increase in quantity of action obtained by the adoption of that mode which produces the greatest effect. The weight of pump-rods, &c., which effects the pumping or return stroke in a Cornish engine

is greater than the weight of the column of water, by the amounts necessary to overcome the friction of the water in the pipes—to displace the water at the velocity of the stroke—to overcome the friction of the pit-work, and of the engine itself. The absolute resistance opposed to the steam consists of the weight which performs the return stroke, *plus* the friction of the engine and pit-work, and the elasticity of the uncondensed steam. The water-load in the Huel Towan engine was very accurately ascertained as 11 lb. per square inch on the piston; and it is shown that the additional resistance amounted to 7 lb. in the Huel Towan, and to 6 lb. in the other engines, so that the whole resistance in the Huel Towan engine is 18 lb. per square inch of the piston. Now, the elastic force of the steam at the termination of the stroke, and before the equilibrium valve is opened (ascertained from the ratio of the volumes of steam and water consumed), is only 7 lb. per square inch, that is, 4 lb. less than the water-load alone. The correspouding results for the other two engines are eqnally remarkable, and show most distinctly that, at the termination of the stroke, the pressure of the steam is far below the water-load, as had been previously observed by Mr. Henwood and others. The next step in the analysis is to determine the portion of the stroke performed when the pressure of the steam in the cylinder is just below the resistance, and then to separate and estimate the spaces through which the piston is driven respectively by steam of a pressure not less than the resistance, and less than the resistance. These facts being ascertained, the virtual or useful expansion, and the dynamic efficiency of the steam, during the two portions of the stroke, are known; and it appears that there is a deficiency of power, as compared with the resistance overcome, of above 3 lb. in the Huel Towan, and more than 4 lb. in the other engines, per square inch on the piston. From these startling facts, and a careful examination of Mr. Henwood's indicator diagrams, the author was induced to inquire whether the piston had not been impelled by a force altogether distinct from the continuous action of the steam upon it, namely, by a force which is to be referred to the sudden impact on the piston when the admission valve is so fully and instantaneously opened, as it is in these engines, and a free communication established between the cylinder and the boiler. To this instantaneous action on the piston, the author, for the sake of distinction, assigns the term *percussion*; and, proceeding to analyze the authentic facts under this view, it appears that the space of the cylinder through which the piston was carried by virtue of this percussive action was about 21 inches in the Huel Towan, 27 inches in the Holmbush, and 33 inches in the Fowey Consols engines. The results thus unfolded, which are facts independent of any hypothesis, appear less startling on a full consideration of the circumstances under which the steam is admitted into the cylinder. The engine has completed a stroke, and is brought to rest by the cushion of steam between the piston and the cylinder cover; a vacuum is formed on the other side of the piston; the elastic force of the steam in the cushion then nearly balances the resistance. A communication is now suddenly opened between the cylinder and the boiler containing steam of a high elasticity; and the piston, being ready to move with a slightly-increased pressure, receives a violent impulse from the steam's instantaneous action. The piston having started, the influx of the steam is more or less retarded by the throttle valve, and its elastic force, though at first greater than the resistance, is soon reduced considerably below it, the mass of matter in motion acting the part of a fly wheel, absorbing the excess of the initial power over the resistance, and discharging it by degrees until the stroke is completed. The indicator diagrams, which are the transcripts of the piston's movements, show that such may be the nature of the action on the piston, and the discussion of numerous well-established facts and phenomena, for the Cornish engiues, strongly confirms this view of the case. Whatever may be the theory of the steam's action, the fact that the sum of those actions has carried the piston through its course, is certain; and it seems equally certain that the quantity of water as steam which entered the cylinders was insufficient alone to overcome the resistance. The author then investigates the amount of useful action due to the steam imprisoned between the piston and the cylinder cover, and recovered each stroke, which, for its use in bringing the engine to a state of rest at the end of the return stroke, he terms the *cushion*. This quantity, though small, is appreciable, and its value is assigned for each engine. The author treats lastly of the evidence furnished by the diagrams of the indicator, and of its utility as a pressure gauge. The communication is accompanied by elaborate tables of the results of the analysis, and an appendix with the calculations worked out in detail.

A discussion of this new view of Mr. Parkes took place among the members, many of whom were not inclined to attribute the effects of the action gained to the cause assigned by Mr. Parkes.

Mr. Wicksteed declined at present giving an opinion upon the theory before the meeting. He stated, that he was still trying experiments upon the engine at Old Ford—that the results up to the present time were in accordance with his anticipations—that, with small screenings of Newcastle coals, the duty of the engine amounted generally to 75 millions, and sometimes to as much as 81 or 82 millions. He thought that 7 lb. per square inch for friction and imperfect vacuum was too large an allowance for an engine of the size of that at Old Ford, as, when the speed was 10 to 11 strokes per minute, the power was equal to 200 horses, and, if an allowance of 6 or 7 lb. was made, it would be equal to 100 horses extra power, which he felt certain could not be correct. At the same time, he believed that in very small engines the amount of friction, &c., might be correctly estimated at 6 or 7 lb. per square inch.

Mr. Seaward considered the paper to be very valuable, as opening a new view of the action of steam, and inducing discussion and experiment; but he was not prepared to allow at once the percussive action, nor could he admit it to be the cause of the increased duty, as, if so, an augmentation of pressure in the boiler would give a corresponding increase of duty. Engines were worked at all pressures up to 60 lb., and even higher; but it was not perceived that the highest pressure gave the best results. He attributed the increase of duty to an improvement in the manner of using coal under the boilers; to the use of good non-conducting substances for clothing the cylinders, steam-pipes, &c., to prevent the radiation of heat; and to the general improvement in the construction of the valves and other parts of the engines, the proper dimensions for which were at present better defined. The expansive principle did not seem to have operated so well in the rotary as in the pumping engines. Several Scotch boats had been worked with steam at a pressure of 33 lb. on the inch, without any corresponding advantage. The increase of duty, then, he attributed to other reasons than the effects of percussion, as, independent of other considerations, the steam must always have possessed the same percussive force, which it must have exercised without producing the effects now attributed to it.

Mr. Parkes remarked, that many observing men had conceived doubts of the sufficiency of the commonly-received theory of expansion to explain the excessive economy of the Cornish above the unexpansive engine. Some had recorded this opinion. Mr. Henwood found the steam's force in the Huel Towan engine unable to sustain the water-load alone. Messrs. Lean showed a similar deficiency of steam power in an engine at the United Mines; and Mr. G. H. Palmer was perfectly correct in his statement, that the absolute force of steam as commonly appreciated was inadequate to the performances assigned to it; but he was wrong in asserting that these effects had not been obtained, for they were indubitable. As doubts had been expressed with regard to the accuracy and sufficient duration of the experiments selected as the basis of his analysis, he would state, that Mr. Henwood obtained the quantity of water consumed as steam during a continuous observation of 24 hours, having previously measured the water discharged by a given number of strokes of the feed pump, and then counting the entire number of strokes made to supply the boilers during the experiment. The pump was used periodically, and its whole contents injected into the boilers at each stroke, so that no material error could arise as to the quantity of water consumed as steam. With respect to the resistance overcome, Mr. Henwood several times measured the whole height of the lifts in the most careful manner, not comprehending the fact of the steam's force being unequal to sustain the load of water alone. Not content with this, he measured the water discharged by the pumps, and found a near correspondence with the calculated quantity. If any error existed in the statement of the water evaporated, it was more likely to be in excess than in deficiency; for it would be admitted that the conversion of 10½ lb. of water into steam, by 1 lb. of coal, was not a common occurrence. Yet, granting this result to have been obtained, it appeared that there was not steam enough to overcome the resistance. Such was the result of the analysis of the Huel Towan and Fowey Consols engines, for which the evaporation was ascertained; and if less water had been converted into steam, the deficiency of power, compared with the effect, would necessarily have been still greater. Mr. Henwood's statement of the performance of the Huel Towan engine was confirmed by a previous trial of the same engine in 1828, conducted by a committee of twenty-one competent persons, when it appeared, after twenty-six hours' experiments, that 87,209,652 lb. had been raised one foot by a bushel of coals. Mr. Henwood's experiment gave 81,389,900 lb., so that in the analysis the lowest result was used. It had been urged, that if any such force as percussion belonged to steam now, it always formed one of its properties. This was true; but it either may not have been well applied, or its effect not detected. The expenditure of power, as derived from the quantity of water consumed as steam could not be determined so long as any condensation of steam took place in the cylinder; for whatever steam was there condensed had lost its power. The perfect clothing of the Cornish cylinders rendered the analysis of the action derived from a given quantity of water as steam nearly free from error. Mr. Wicksteed had stated, that when he kept the steam out of the jacket of one of Boulton and Watt's engines, it required full steam throughout the stroke to overcome the load: whereas, with steam in the jacket, some expansion could be used. This would show a greater expenditure of power in one case to produce an equal effect. Such, however, could not be: an equal power operated in both cases, but in the one, a portion of it was annihilated, or had produced no useful effect. Mr. Parkes considered it as demonstrated, that a force, independent of the steam's simple elastic force within the cylinder, did operate in the Cornish engines. The term *percussion* might be objected to, when applied to an elastic fluid. Nevertheless, he conceived that the instantaneous action transmitted to the piston, on the sudden and free communication effected between the cylinder and boiler, must produce an effect analogous to the percussion of solids. He considered the proofs of such action adduced in his paper as irresistible. He would ask, how it could be accounted for that the steam was in a state of expansion during 19 out of 20 parts of the stroke in the Huel Towan engine, as shown by the indicator diagram, though it was freely admitted during one-fifth of the stroke, unless a velocity had been given to the piston by an initial force exceeding that of the steam's simple elastic force? How was it that, at the end of the stroke, the steam's elasticity was able to sustain so small a portion of the load in equilibrio, unless a momentum had been transferred to the mass by the impact on the piston, and aided the expanding steam to complete the stroke, which alone it was incompetent to perform? A The greater degree of at-

tenuation in which the steam was found on the completion of the stroke in one engine than in another, compared with the pressure of the resistance, and with the amount of expansion determined by the period of closing the valve, alone proved that the ordinary theory was inadequate to explain the action of steam in these engines. He had for some time conjectured that a hidden and unsuspected cause influenced the performance of the Cornish engine; and if he had not been successful in discovering its nature, he considered the analysis as placing the fact beyond question, that the quantity of action resulting from the steam admitted into the cylinder was much below the force of the resistance opposed to it, and overcome.

ORIGINAL REPORTS OF SCIENTIFIC MEETINGS.

(Contributed expressly to the Inventors' Advocate.)

MEETINGS OF THE SCIENTIFIC BODIES OF LONDON,—FOR THE WEEK COMMENCING NOVEMBER 30, 1840.

Monday.	Royal Society (Anniversary)	1	P.M.
	Botanical Society (Anniversary)	8	P.M.
	Medical Society	8	P.M.
Tuesday.	Linnæan Society	8	P.M.
	Horticultural Society	2	P.M.
	Architectural Society	8	P.M.
	Uranian Society	8	P.M.
Wednesday.	Society of Arts	7½	P.M.
	Geological Society	8½	P.M.
Thursday.	Royal Society	8½	P.M.
	Society of Antiquaries	8	P.M.
	Zoological Society	3	P.M.
Friday.	Botanical Society	8	p.m.
Saturday.	Asiatic Society	2	P.M.
	Westminster Medical Society	8	P.M.
	Mathematical Society	8	P.M.

BOTANICAL SOCIETY OF LONDON.

Nov. 20. John Reynolds, Esq., Treasurer, in the Chair.

Mr. H. C. Watson exhibited specimens of *Geranium pusillum*, found during last summer on the railway mound between Esher and Walton stations, Surrey, in which the following monstrosities were apparent: the branches terminated in heads or umbels imperfectly formed by the multiplication and adhesion of flowers and their stalks; the petals were mostly green and imperfect; and the anthers usually abortive. A monstrosity of *Saxifraga sarmentacea* was also presented, in which the parts of the flower had become foliaceous—in some flowers the seed-vessel was transformed into two small leaves, and the seeds into very small leaf-buds, resembling the young plants on the runners: this specimen was taken from a garden frame.

A paper was read from Mr. James Harvey, now resident in Jamaica, communicated by Mr. C. E. Wilson, on the "*Mikania Guaco*," being additional facts relative to its worth as a cure for hydrophobia, and the bites of venomous serpents.

Mr. Harvey, while in South America, with Col. Johnson and Capt. Friend, collected many objects of natural history, some of which are deposited in the British Museum, some in that of Santa Fé de Bogota, &c. The facts adduced in this communication, being from undoubted authority, are deserving the attention and investigation of men of science. It is generally known that Humboldt and Bonpland have noticed and spoken of its virtues in the country where it abounds, and the evidence given by Mr. Harvey must be considered as proofs of its efficacy as a remedial agent. During Mr. Harvey's sojourn in South America (the Andes) his time was principally occupied, together with that of his companions and the native huntsmen, in the chase. The latter pride themselves much on their fine sagacious dogs. He had a pack of hounds which excited much their admiration, and to secure them from the almost certainty of being attacked with hydrophobia in that climate (from over-excitement in the chase, combined with other causes so prevalent unless vigilantly guarded against), they recommended him to give them a decoction prepared like sarsaparilla, from a plant indigenous to the country, the *Mikania guaco*, called by the natives the *bending* or *supple guaco*, which they frequently mixed up with the food eaten by their own animals. Attention was paid to their advice, and never after the use of the *guaco* did canine madness deprive them of a single dog; previously to the hounds taking the decoction they lost one of their finest dogs from hydrophobia. This occurred after hunting the whole of the day without success; and on his return home, he become quite sulky, paid no regard to his food or to his master, and on the next morning he was in a state of furious madness. This occurred prior to their knowledge of the *guaco*, and Mr. Harvey is of opinion that had that animal been disciplined by its salutary properties the dog would not have evinced such *unlimited excitability* during the chase, yet have retained his full necessary ardor.

Of the virtues of this (so justly called by Baron Humboldt) "*precious vegetable*," in cases where the bite from a rabid animal has been inflicted, Mr. Harvey can truly vouch; not, he observes, from well authenticated hearsay, but, from *personal experience*—for Col. Johnson having one evening gone to see the hounds fed, one of them in a rabid state rushed at him and merely tore a part of his shirt sleeve. Mr. Harvey hearing the alarm was soon at the colonel's side, and the animal still infuriated sprang upon him, and while striking at the dog his thumb received a sharp bite from his terrific teeth, some marks of which remain even to the present time. The dog was soon shot, and Mr. Harvey attended to; and to use his own words "the *Mikania guaco* was my preserver. The places where the teeth had entered were seared with red hot wire, and I was made to drink freely, both at and between meals for *forty days* of the *guaco* decoction." Years have since transpired, and Mr. Harvey continues in health. The prescription of the native huntsmen was not prescribed at hazard, nor even in the light of a doubtful remedy. They knew from trial its efficacy; inasmuch as one of them some time previous had a great piece of flesh bitten quite out, by a rabid animal, and the same regimen of drinking the *guaco* decoction forty days, prescribed for Mr. H.'s cure. effected his.

Mr. Harvey states that he allows but little credit to the red hot wire, as it is well known that such applications have in similar cases in most countries been tried without avail. The person bitten having to wait until the wire is heated, during *which time*, be it ever so short, a portion of the saliva has commenced circulating with the blood.

The native hunters (for it is but little known to the new settlers) hold this plant in great esteem, not only as an antidote for hydrophobia when taken into the stomach, but when, by means of inoculation, introduced into the system they consider it a most efficacious preventative of the injurious effects that occur from the sting or bite from venemous reptiles. A strong extract is made from the plant; which extract they introduce into slight incisions made on the back of the hand, between the finger and thumb, also on each breast and on each foot. The person operated on, then drinks for fifteen days of the *guaco* decoction, and as that month returns in succeeding years (to keep up the full strength of the *guaco* in their system) the decoction is again for the same number of days drank. The inoculation is but once performed.

Baron Humboldt asserts that it is to the celebrated Mr. Mutis the world is indebted for the inestimable advantages offered to medicine by this plant, and states that from the numerous experiments that have been performed in Santa Fé by Mr. Mutis, Zea, Don Pedro, Vorges, and others, it appears fully proved that this is the most certain remedy that can be opposed to the bite of these venemous reptiles that infest the marshy parts of the New Continent.

Mr. Mutis cultivated this plant at his residence in the neighborhood of Bogota with his own hands: esteeming it "the most valuable plant in his possession, because of the power it gave him to protect the lives of so many of his fellow creatures."

The subject is one of interest, and deserving the deliberate consideration of the medical profession, and ought not to lie dormant, from the fact that no specimens of it can at present be procured in this country, although the plant is well known to botanists, and to the learned authorities quoted, as being used with the most beneficial effects in cases of bites received from venemous reptiles.

ZOOLOGICAL SOCIETY.

Nov. 24. W. Yarrell, Esq., F.L.S., in the Chair.

Mr. Cumings exhibited a splendid series of land shells, from the Philippine Islands, preserved with the greatest care by himself, the colors being most vivid and delicate—so delicate are the colors of the epidermis of many of the land shells, that the mere handling of them removes the fine shades of tint; these may be entirely effaced by rubbing with water. Eleven distinct varieties of a beautiful species (*Bulimus Ticaonica*) were exhibited.

A letter was read from Mr. Friendly, of Gibraltar, on a species of *Procellaria* (Petrel),—he promised to present the society with a collection of Brazilian birds. A short communication was read from Mr. Clarke, on the habits of a species of *Fly-catcher*, as yet undescribed, from Cuba. The range of this bird appears to be very circumscribed in the island; found only on its native mountains, at an elevation of from 1,500 to 2,000 feet, where the average temperature of the atmosphere is 88 deg. Fahr., and the bird is not known in situations of a higher temperature. Its common name among the natives is "Musician," so named from its peculiar note, which very much resembles that of a flute. They are rare in the island, Mr. Clark having only shot the specimen exhibited, and has only seen a few of them during 18 months' residence in Cuba.

A paper was then read from Mr. George Gulliver, on the size of the "Blood Corpuscles," in three species of Paradoxurus (the Musangs), the measurements being fractional parts of the English inch. Those of the common Paradoxurus averaged 115693ths of an inch. 2. Those of the two spotted species averaged 114660ths of an inch. 3. Those of the white whiskered one averaged 114236ths of an inch. From other observations made by Mr. Gulliver, he is inclined to support the opinion that the largest blood corpuscles are to be found in the blood of the largest animals, and vice versâ.

The characters of some new species of *Helix* and *Bulimus*, brought to this county by Hugh Cumings, Esq., by W. J. Broderip were read: these specimens were collected in the Philippine Islands.

Mr. John Gould, the Australian traveller, made some verbal observations on ten undescribed species of Australian birds, including some new Honey Suckers (*Meliphaga*), which abound in Australia, and feed principally on the *Banksias*, which flourish in barren ground.

MICROSCOPICAL SOCIETY.

Nov. 25. J. S. Bowerbank, Esq., in the Chair.

A paper was read by Dr. Arthur Farre, entitled "Certain Phenomena observed in the Genus Nitella, as illustrative of the peculiar structure recently discovered by Mr. Bowerbank, in a fossil wood from the London clay." These observations were made by Dr. Farre several years ago, and observed in some specimens of *Nitella flexilis*, kept for the purpose of examining the circulation in that plant, and detailed by Dr. Farre thus:—"In some specimens of *Nitella flexilis* the circulation was observed to be going on vigorously up to the 4th of April, 1835. On the 6th, two days after the last observation, the circulation had entirely ceased. The green particles lining the interior of the stems and branches had shrunk from the parietes, and together with the green circulating matter of the interior were collected together in irregular masses within the tubes; but none of the brown bodies afterwards observed were as yet apparent in any of the pieces.

On the 11th, five days after the preceding observations, and no intermediate one having been made,

the same specimens were again examined, and were found to present characters which Dr. F. had not before observed. In many of the joints, the irregular masses of green matter had resolved themselves into globular bodies of variable size but definite form, and had changed from a green to a rich brown color. About half of the joints had undergone this change, the other half remaining in the green state, as at the last observation, but the circulation had entirely ceased in all, and the plant was evidently dead.—80 of these globules were seen in one joint, and only five in others. The globules varied much in size. They consisted of tolerably regular spheres, except where their form had been slightly altered by lying in contact with each other. In almost all of them however, and especially in the larger ones, there was a slight flattening or cup-like depression at one point. The brown bodies appeared to consist of an enveloping membrane, which was probably formed by the aggregation of the green granules of the plant, assisted by the condensation of the mucous fluid of the interior, thus forming an investing capsule, enveloping the green granules of the plant mixed with mucous fluid."

A paper was read by Mr. Edwin Queckett, F.L.S., on the effects of *moisture* and *dryness* in causing various alterations in the form and conditions of many of the organs of plants, in the recent as well as in dry states, and also it was attempted to be shown that there was some peculiar structure and arrangement of the tissues in those parts where these effects are most manifest. One of the most beautiful is to be seen in *Lycipodium Lepidophyllum*, from Peru, where moisture has the two-fold effect of expanding the contracted plant, and stimulating dormant vitality. The effect of dryness in the tissues of vegetables was alluded to as having the property of preparing the way for the dispersion of seeds. If a poppy capsule be examined when ripening, numerous valves or trap-doors can be discovered beneath the radiated crown, which are intended to give exit to the numerous seeds within. The peculiarities of the *Rhododendron*, *Dianthus*, *Cerastium*, *Erodium*, &c., were alluded to.

In the *Caryophyllex*, when the edge of the valve, or curled part of the seed-vessel, is examined by the microscope, it will be found that the tissues will be different on the external and internal surfaces, both, however, being cellular; but the inner layer, or the cells of the convex borders, are of different dimensions from the outer, being neither so large nor having such thick walls (though they are thicker than ordinary cells), but the outer layers are almost solid, and the only cavity they have is indicated by the spaces between the lines in the cells, the parts being represented in a diagram. In this arrangement, it must be evident that by the shrinking of the tissues by drying, there will occur unequal action, and that one side will be curved in an opposite direction to the other, and that one valve must necessarily be removed from the other; evidently proving that the tissues act as unequal antagonists to each other.

SCIENTIFIC MEMORANDA, AND NOTES ON ART.

Meteorological Phenomenon at Comrie.—On Tuesday evening the 17th inst., between seven and eight o'clock, an interesting appearance was observed in the sky, over this place. From a semicircular small black cloud on the verge of the western horizon, at the point N.W. by W., all the other clouds in view spun out into long dark streaks, diverged like spokes from the nave of a wheel, and after extending in almost unbroken lines over the whole sky, again converged in an exactly similar form on another small black semicircular cloud, in the opposite point of the horizon. At each focus between the spokes, the light of the aurora borealis was very distinct, leaving no doubt as to the cause of this unusual arrangement of the clouds, and contrasting beautifully with the dark dresses of the present fleecy partners of these "merry dancers." The western focus was at first very brilliant, and while it continued so the other was more faint. By and by this relative brightness of the two ends was entirely reversed, and the eastern had its "turn" of display for about half an hour, after which the whole scene gradually broke up—the clouds, like soldiers relieved from the constraint of parade, dispersiug themselves into their usual amorphous groups over the sky. This phenomenon establishes at least two points in meteorology. 1st. That the meridianal lines of clouds often observed in the daytime extending across the heavens from north to south, as well as other directions, without, of course, any visible display of the aurora, are nevertheless the effect of this electrical or magnetic influence, and not, as some have supposed, of currents in the air. 2d. That the height at which the aurora occasionally displays its fantastic gambols may coincide with, or extend to, that of the clouds in the atmosphere, although at other times its stage appears to be much more elevated. The writer of this note, some years ago, had an opportunity of calculating the altitude of the apex of a splendid auroral dome, consisting entirely of lights of many various hues, that then appeared near the zenith. The calculation was made from simultaneous observations, taken at Stirling and Comrie, and gave the height at 113 miles above the surface of the earth.—*Scotsman.*

New Method of perforating Glass.—Put a drop of spirit of turpentine on the spot where the hole is to be made, and in the middle of this drop a small piece of camphor. The hole can be then made without difficulty, by means of a well tempered borer, or triangular file. Solid turpentine answers as well as the spirit and camphor.—*Annales des Mines.*

New Mode of Marking Linen.—Simply cover the linen with a fine coating of pounded white sugar; impress upon it a stamp of iron very much heated, and in two seconds the linen will be slightly but indelibly scorched—marked with the mark.

Preparation of Litmus, or Archil of Commerce.—It is procured from the prepared *Strallus* (leafy expansion) of the Lichen, (a vegetable ranking with the mosses, sea-weeds, &c., as to structure,) *Rocella tinetoria.* This lichen, after having been cleaned, dried, and powdered, is mixed with pearlash and moistened with urine, when a species of fermentation ensues, which is kept up until the material becomes a blue pulp; it is then mixed with a certain quantity of chalk and potash, and dried. In this state it constitutes the *litmus*, or *archil* of commerce. It is chiefly used by silk dyers.—*Brande's Pharmacy.*

Vegetable Wadding.—Mr. Yarrell, F.L.S., exhibited at the Linnæan Society, a specimen of a satin-like mass of *Conferva fluviatilis*, which grew in a water meadow near Totness. A spring, which flows only in winter, rises in the meadow, and this substance is taken from narrow gutters, from one of which, twelve inches wide, a piece was taken up which measured seventy-nine feet in length, so firm and tough was its consistence; and another piece broke off at thirty-nine feet. In consistence and appearance it bore considerable resemblance to a piece of cotton wadding, but of a firmer texture. A portion was carefully examined under the microscope, and found to consist entirely of an interwoven mass of filaments of *Conferva fluviatilis.* The plant was compared with the authentic specimen of that species preserved in the Linnæan Herbarium, and was seen to differ only in the greater length of the articulations. The under surface of the mass was of a bright green color, but the upper surface was white from the effects of direct exposure to the air and light, which had caused the death of the plant at that part,—*Proc. Linnæan Society*, 1840.

VARIETIES.

Monument to Watt.—The subscribers to the fund for erecting a monument to the memory of Watt resolved, at a general meeting on Saturday last, to place a marble statue, by Chantrey, in a favorable site in the College, if it can be acquired with the money remaining at their disposal. We are glad to learn that, after a delay of above seventeen years, such a measure should have been finally determined on.—*Scotsman.*

The Mulberry.—M. Seringe argues, from physiological facts, that pruning the mulberry at the same time that the leaves are gathered, will produce a handsomer and longer lived tree, and a greater abundance of leaves.

Discovery of a rich Copper Vein.—We hear a discovery has been made on the property of Lord Poltimore, at Northmolton, on the borders of Exmoor, of a rich copper mine, the ore of which is said to abound with a large portion of gold. The ore is of the purest kind, found in large bunches, and pieces of gold of some size have also been met with.—*Western Times.*

Effect of Railways upon Turnpike Trust Property.—The tolls of the Colnbrook turnpike roads have just been let for one year, by public auction, for £1,850. Last year the same tolls were let for £2,145; and within the last three or four years they have been let as high as £3,975. As the lines of railroads in their immediate vicinity (the Great Western and the London and Southampton) have advanced towards completion, the tolls have gradually decreased in value.

Spontaneous Combustion of Coals at Sea.—The bark Amazon, of Liverpool, sailed from Pembrey, (near Llanelly) on the 9th of May last, bound for Bombay, with a cargo of coals. On the 4th of June, in lat. 9 29 N., long. 25 20 W., a large mass of coals ignited from spontaneous combustion. The captain writes, that "they broke out in a solid body of fire." He immediately got the hatches well battened down, and every place well stopped up by which air could enter, in order, if possible, to smother the burning. On the 6th he opened the hatches, but the heat and sulphurous smell prevented the possibility of going below. He then closed them again, stopped up the scuppers, and through holes bored in the deck poured from the head pumps and with buckets so much water upon the coals, that by next day there were five and a half feet of water in the hold, and the coals, as Captain Campbell writes, "well cooled down." The same evening they commenced discharging the heated coal and cinders, and threw overboard about 250 tons, before the captain could consider the ship safe.—*Liverpool Albion.*

The Boiler Explosion at Bromsgrove.—The *Worcester Chronicle* gives the following account of the position of the parties when the boiler burst—"The position of the parties at the moment of the fatal explosion was as follows:—In front of the furnace or fire-box stood Scaife, and immediately behind him was a circular aperture, about two feet in diameter, made for the purpose, we believe, of allowing the fireman or stoker to get in and out of the engine. Rutherford was standing at his side, but a little distance from him, and on one side of the fire-box, with his back near to some brass railings, which are placed along the top of the carriage engine at this part. Henshaw and Paul, the stoker, were alongside of Rutherford, and Luke, and the other persons, were near the same place, but farther back. The explosion was caused by the collapsing, or bending inwards, of the iron of the boiler on which the fire acts, owing to its not being of a sufficient thickness. Instantaneously upon the explosion, Scaife was blown through the round hole at his back, to a distance of twenty-five yards. On inspection by the jury, his remains presented a shapeless mass, scarcely recognisable for those of a human being. Rutherford was projected through the brass rails, three of which were broken by the force of his body, and thrown to a distance of many yards. The fireman, Paul, Henshaw, and the others, were thrown up into the air, over the rails, and were all injured more or less, but no more lives are likely to be sacrificed in consequence of this sad affair. So terrific was the force of the explosion, that the chimney was blown to a distance of 100 yards; the top of the furnace, a weighty piece of iron, was thrown completely over the station, and was found stuck fast in a bank at the back of it; and a spanner, or screw wrench, was propelled so high into the air, that when it fell upon the roof of the station, it passed clean through it to the ground.

Sir George Cayley's Steam Carriage.—The engineer of Sir George Cayley's steam-carriage, which recently became unmanageable in Sloane-street during an experimental trip, and ran into a silversmith's shop, died on Monday last from the injuries he received. An inquest was held on his body on Tuesday, when it appeared that the carriage, which was an improvement on Gurney's model, had been worked about two years back on the Gloucester and Cheltenham road with success. It had lain by for the last eighteen months to be further improved at the premises of Sir George Cayley, in Holywell-street, Millbank, from which premises, on the 21st ult., it was brought out for the purpose of being conveyed to Hounslow, in order to be tried upon that road. The carriage worked well until it got into the Vauxhall-bridge-road, when deceased, who was steering the carriage, in order to avoid running over a boy who had been thrown down by another boy five yards in advance of the machine, ran it upon an embankment, thereby straining and injuring the springs of the steering wheel. The injury, though the machinery was examined, could not then be ascertained, and the vehicle was again put in motion, and had proceeded up Sloane-street, when, opposite to the shop of Mr. Collier, silversmith and jeweller, the man in charge of the steam-valve suddenly perceived deceased using all his strength to direct the steering-wheel without success, and feeling that there must be somethiug the matter, he immediately shut off the steam. The consequence of doing so was, that the off fore-wheel of the carriage was run on the foot-pavement, and the small quantity of steam remaining unescaped swung the vehicle round in a half circle, throwing the front of it into Mr. Collier's shop-window, just as deceased was in the act of descending. In the collision that took place, deceased's right leg, a little above the calf, was jammed between the vehicle and the window-frame, and cut by the broken plate-glass. He was instantly conveyed to the hospital, where he lingered till Monday. The jury returned a verdict of "accidental death," with a deodand of £10 on the steam-carriage, for the purpose of showing, as the report states "that the jury disapprove of the use of such carriages on common roads as being dangerous."

Fertility of the Soil in British Guiana.—It has been recorded that an acre of land in these territories has produced 6,000 lbs. of sugar, or 20,000 lbs. of plantains. At Mary's Hope, on the Corentyn, 8,000 lbs. of sugar have been produced on an acre; and with regard to plantains, it is generally calculated that an acre gives seven bunches a week throughout the year. The above weight of 20,000 lbs. is by no means extraordinary, since instances are known that 30,000 lbs. of plantains have been produced.—*Schomburgh on the Productions of British Guiana*, 1840.

ADVERTISEMENTS.

HUXLEY'S STOVES, with Patent Air and Metallic Self-acting Regulators, embrace all the advantages of the Stoves commonly called "Dr. Arnott's," and are free from those objections which have given rise to so many just complaints. They will burn from ten to thirty hours without attention, at a very small cost of fuel. If fixed and used according to the directions, they are warranted to answer the purpose, and the regulators not to get out of order. Various sizes and patterns of the above, as well as Improved Register and Economical Cooking Stoves, to be seen at the Manufactory, 16, Castle Street, Long Acre, adjoining Messrs. Combe and Delafield's Brewery.—Huxley's Patent Stoves may also be obtained from Mr. Boyd, 105, New Bond Street; and Mr. Boulnois's Furniture Warerooms, 14, Charlotte Street, Rathbone Place.

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INSECURITY of IRON SAFES.—Any cast-iron safe may be easily broken into by a large hammer, and nearly the whole of the safes in common use can be burst open in a few minutes without making any alarm by a new burglar's instrument. CHUBB'S PATENT WROUGHT-IRON and FIRE-PROOF SAFES, Chests, and Boxes, possess perfect safety from all attempts to open them, and from the severe tests which they have undergone they will be found to give complete security from fire. Patent detector locks, street-door latches, cash-boxes, &c.—57, Saint Paul's Churchyard.

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CHEAP PLATE-GLASS, called SHEET PLATE-GLASS.—Important to Architects, Builders, Print-sellers, and the Public.—Nothing so much improves the external appearance of dwelling houses and public buildings, and at the same time contributes in no small degree to the enjoyment of the inmates, as windows glazed with Plate-glass, and it is only owing to the high price that the use of it has been so limited until now. The British public will, therefore, hear with satisfaction that the same enterprising manufacturers who lately introduced the manufacture of Sheet-glass in this country, have improved this article so much as to be enabled to work it into Plate-glass by a new process, secured by Royal Letters Patent, and by which they produce an article quite as good as the British Plate-glass, with the important advantage of being considerably cheaper, thereby affording the facility of glazing dwelling houses and public dwellings with PLATE-GLASS, at moderate prices. This new Plate-glass is also particularly well suited to Drawings, Engravings, &c.—Sold, wholesale and retail, by CLAUDET and HOUGHTON, at their Glass Warehouse, 89, High Holborn, where printed lists of prices may be had.

VINEGAR.—"It is generally the rule to judge of the progress of any country towards civilization by the advances made by it in the arts and sciences. Should any one so judge of us by our manufacture of vinegar, how wofully deficient should we appear in our boast of being the most civilized nation in the world."—Polytechnic Journal, The acknowledged superiority of foreign vinegars, both for quality and flavour, having induced Messrs. GRIMBLE and Co., to give the subject an attentive consideration, they have now the satisfaction to inform the public that they have succeeded in manufacturing a VINEGAR, equal if not superior, in the estimation of the best judges, to that of any foreign country. The agreeable flavour, unalterable purity, and brilliancy of this commodity, and consequent adaptation for pickling, render, in this respect the Royal Orleans a vinegar surpassing in quality that of the finest continental production. The use of salads, so conducive, medically speaking, to the preservation of health, has been injuriously abridged at our tables in consequence of the inferior, or, at all events, uncertain qualities of vinegar as usually prepared in this country. Owing to this cause our pickles and salads are but little esteemed and sparingly used, whilst they are wholly rejected by the foreigner and continental traveller. In order to enable the public fairly to judge of this vinegar in its genuine state, the following are a few of the Italian warehouses where it may be obtained in sealed bottles, at 1s. each, bottle included, or in any quantity:—Finch and Co., 11, Ludgate-hill; W. D. Prichard and Co., 36, Devonshire-street, and 50, Leadenhall-street; R. and C. Faulkner, 44, Jermyn-street, St. James's; Robert Wood, 132, New Bond-street; Barraugh and Fall, 1, New Cavendish-street; W. Hughes, 12, King-street, St. James's; Frost and Hardstaff, 89, High-street, Camden-town; Lawsons, 33, Coleman-street; J. Jackson, 194, Edgeware-road; R. Howse, 47, Albany-street; W. Darby, 6, Queen's-buildings, Knightsbridge; H. Smith, 146, Shoreditch; Robinsons, 10, Great Russell-street, Covent-garden; H. Bentham, 62, Piccadilly; E. and J. Taylor, 17, Lower Holborn; Zetterquist and Son, 60, Blackfriars-road; H. Collins, 88, Fleet-street; Thomas Fraser, 63, New Bond-street; Sledden and Stocking, 42, High-street, Marylebone; J. Garnett, 38, Wigmore-street; Riches and Son, 3, Charles street, Parliament-street; W. Clark, 74, St. John-street; E. Ashby, 1, Old Broad-street; Christopher Heron, Uxbridge, Middlesex; Walkers, Thistle-grove, Little Chelsea; C. Young, High-street, Islington.

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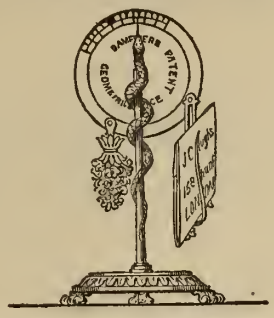

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Repertory of Arts.
Transactions of the Society of Arts.

ACTS OF PARLIAMENT.

PATTERNS,—
27 Geo. III., c. 38; 2 Victoria, c. 13; 2 Victoria, c. 17. (The last relates to patterns and *models*.)

PATENTS FOR INVENTIONS,—
2 and 3 Victoria, c. 67.

SCULPTURES,—
38 Geo. III., c. 71.

ENGRAVINGS,—
7 Geo. III., c., 38; 17 Geo. III., c. 57.

COPYRIGHT,—
8 Anne, c. 19: 12 Geo. II., (Booksellers' Act), c. 36; 15 Geo. III. (Universities' Act), c. 53; 54 Geo. III. (General Copyright), c. 156.

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THE

INVENTORS' ADVOCATE,

AND JOURNAL OF INDUSTRY;

A WEEKLY BRITISH AND FOREIGN MISCELLANY OF

SCIENCE, INVENTIONS, MANUFACTURES, & ARTS.

No. 71.] SATURDAY, DECEMBER 5, 1840. [PRICE FIVEPENCE STAMPED. CIRCULATING FREE BY POST.

ADAPTATION OF LOCOMOTIVE ENGINES FOR RAPID MOTION.

We stated in a preceding number that the locomotive engines hitherto employed on railways are not fitted for rapid motion. It was shown that, according to theory, there should be a considerable saving of power by increasing the speed on railways, and yet that practice gave a contrary result. This effect does not arise from error in the theory, but from the defective construction of the engines; which are only fitted to travel, without waste of power, at a speed of about ten miles an hour; at a greater velocity there is an immense waste of steam. This we shall first shortly explain; and then point out methods by which this defect may be obviated.

The cylinders of locomotive engines in general use are about twelve inches diameter, and the stroke of the piston about eighteen inches. The piston rods are fixed directly to a crank on the axle, so that each double stroke produces one revolution of the wheel. The driving wheels are usually about five feet in diameter; which, allowing them not to slip on the rails, would move the carriage about fifteen feet at each revolution of the wheels, and at each double stroke of the piston. The velocity of the piston is in such case about one-fifth that of the motion of the engine, and when the latter is travelling at a speed of twenty miles an hour, the piston is making about one hundred and thirty double strokes in a minute. When the speed is thirty miles an hour, the number of double strokes amount to about one hundred and eighty per minute. Now, it must be evident, when the piston moves with such great velocity, and the cylinders have to be charged with steam and emptied three hundred and sixty times in a minute—as they must be at a velocity of thirty miles an hour—that the waste steam cannot have time to escape freely through the eduction pipes. The piston has, therefore, to act against the pressure of the steam on the other side of the piston, and a great part of the expansive force of the steam on one side the piston is actually wasted in forcing out the steam from the cylinder on the other side. Again; as the piston rods are fixed directly to a crank on the axle, the motion of the carriage works the piston, and necessarily increases the consumption of steam in proportion to the velocity; allowing that it is generated in the boiler with sufficient rapidity to keep up the supply at the same degree of pressure.

We thus see, from the foregoing statement of the action of locomotive engines, the cause of their losing power when moving at high velocities. In the first place, the steam is acting against itself in the cylinders, thus producing a dead loss of power; and, in the next place, the motion of the wheels themselves exhaust the same quantity of steam, by their action on the pistons, whether it be required or not. By this malformation of the engine it is thus entirely deprived of the advantages which animal power possesses, within certain limits, of being exorted in a greater or less degree as occasion requires. We conceive, however, that this faculty might readily be given to locomotive engines, and even to a much greater extent than it can obtain in animal power. We will proceed, therefore, to consider the methods by which the existing defects of locomotive engines, as applicable to rapid motion, may be remedied.

The most obvious way of producing a more rapid motion by the same number of strokes of the piston is to increase the size of the driving-wheels. This has been tried; but the greater power required to move the load is an objection to its adoption. Wheels of ten feet diameter have been tried on the Great Western Railway, and have been laid aside as useless. The adoption of such wheels without a suitable alteration in the working parts of the engine might, indeed, entail a great loss of steam, as engines of much greater power would be requisite to set the train in motion, and when the velocity was acquired, the steam power would be wasted in the same manner as it is in ordinary engines.

The next plan that suggests itself, and which has also been tried without success, is to give a multiplying power to the driving-wheels, by wheels and pinions attached to the piston rods; instead of communicating the motion directly from the piston rods to the axle. This method would also require engines of greater power, whilst there would be a loss of motion from the friction of the wheels. In practice, too, it was found that the wheels and pinions got out of order by the jarring motions of the engine; this method was therefore abandoned.

The plan which it appears to us would meet all objections, and could be readily adopted with great saving of steam-power, and far greater facility of obtaining rapid motion, is that of working the engines expansively—regulating the quantity of steam admitted into the cylinders to the power required.

The object to be attained on railroads is to have the capability of applying great power when wanted for starting the trains and communicating a high velocity; and then the capability of diminishing the power when it is not wanted, without any loss of steam. In order to increase the power, we would substitute for the present twelve-inch cylinders, other cylinders of at least double the area. By this means the power of the engines could be doubled with the same boilers, for a limited time, and wheels of ten feet diameter could be turned with as much ease as the present five feet wheels, for a time long enough to start the train and communicate its greatest required speed. When the train is in motion, and the force required to maintain it at that speed is only equivalent to the resistance of the air, the friction of the axles, and the surface-resistance of the rails, the quantity of steam admitted into the cylinder at each stroke might be diminished in a proportional degree; so that the power employed might at all times be regulated by the force required to overcome resistance. When, for instance, the inequalities of the rails, or an inclination of the road, required extra power to lift the load over those parts of the line, the engineer could admit a greater quantity of steam at each stroke; and when again the road was level he might cut off the steam at a half or quarter stroke, or even less.

The advantages of this plan, of having larger cylinders and working the engines expansively, would be greater than the mere regulation of the power to the resistance—important as that alone would be. It would also have the advantage of great saving in steam power; and enable locomotive engines to move with any degree of speed with little loss of power, and with a great gain from the diminution of friction. For instance, as each double stroke of the piston with a ten-feet wheel would move the engine twice the distance the revolution of the five feet wheels would carry it, half the number of strokes could do the same quantity of work. Therefore, even if the engines were worked with steam of full pressure, there would be the advantage of more time gained for the escape of the waste steam, and the entrance of the steam from the boiler. But when the engines are worked expansively, and the supply of steam is cut off at quarter

stroke, the quantity of waste steam is only one fourth, and the steam admitted on the other side the piston has not to act against the escaping steam, nor to exhaust its power in forcing it out. There would therefore be a saving not only in the quantity of steam admitted into the cylinders, but also in the application of the power by removing the obstruction to its action. With an engine constructed and worked on the plan we have proposed, the force employed could be always nicely adjusted to the resistance to be overcome, and the locomotive engines would, in respect of the variation of their powers to particular circumstances, even exceed the capability of animal power. The loss of steam, which is now so enormous with common engines when moving at high velocities, would be prevented, and the expansively-working locomotives, with large cylinders and large wheels, would effectually prove the saving of power by increased rapidity of motion.

These views of the efficacy of working locomotive steam engines expansively, do not depend altogether on untried theory. They are fully borne out by some experiments which have lately been made on the Hull and Selby railway; an account of which is subjoined. In those experiments the principle for which we are now contending was but partially applied, but the saving of fuel by working the steam expansively, with cylinders of the ordinary diameter, was proved to be nearly two-thirds. Had larger cylinders been used, with larger wheels, we have no doubt that the result would have been still more decidedly in favour of working the engines expansively.

EXPERIMENTS WITH LOCOMOTIVE ENGINES, ON THE HULL AND SELBY RAILWAY.

On Tuesday, the 10th ult., a course of five days' experiments commenced with the engines of the above railway, originating through the following circumstances:—

About the commencement of the present year, six engines, somewhat similar to those on the Leeds and Selby line, were in a greater or less state of forwardness for the Hull and Selby Railway, at the works of Messrs. Fenton, Murray, and Jackson, of Leeds, when the Hull and Selby Railway Company resolved to have six other engines, on the most approved construction which experience up to that period could produce from the previous working of locomotives on the various railways. Four objects were particularly kept in view, namely, safety, simplicity, and accessibility of the various parts; economy of fuel; and the general efficacy and durability of the engine throughout.

The first object is secured by giving a more extended base for the action of the springs in supporting the weight of the engine, being about six and a half by eleven feet, whereby a remarkably steady motion is secured at thirty miles per hour. It is not at all a matter of surprise that the four wheel engines of several railways now in use should every now and then go off the road, and in an instant, when it is recollected the extreme base of their springs for supporting the engine is only about three and three quarters by about six feet; hence their rocking, serpentine, and pitching motion, which without any other cause than a slight increase of speed, literally lifts the flanges of the wheels above the surface of the rails, and in three or four seconds the engine is turned end for end, upset in the act, and the train with it; whilst the stability of the engine is effectually secured through an extended base upon the front and hind wheels. By means of a new combination, the best properties of the four-wheeled engines are also completely applied, by resting the weight on the crank shaft immediately within the wheels, which experience has for years proved to be the place least likely to injure it, and thereby avoid the alarming accidents which have so often taken place by the breaking of the shaft, through placing the weight on bearings outside of the wheels; the centre of the engine being a sort of neutral axis, there is very little power over its motion in that part, and this advantage, by placing the weight on the crank inside the wheels, is, in consequence, got without a sacrifice of stability.

Secondly.—In addition to the safety and simplicity of having only *two* inner frames, instead of three or four, with as many bearings on the crank shaft, the space under the boiler is still further stripped of machinery by a new valve motion, which gives a high degree of openness and facility of access, so desirable in examination, cleaning, &c. of the working parts.

Thirdly.—The steam being used expansively by the valve motion above alluded to, a great saving in fuel is effected, as will be seen on examining the results of the experiments, and whilst the excessive wear and tear of locomotive boilers arises from intense heat, it is not improbable this decided step towards removing the cause will necessarily prevent its effecting the rapid destruction of the boiler. The action of this valve motion is perfectly smooth, being worked by eccentrics (which are also of an improved construction), and any quantity of steam from 25 to 90 per cent. on the stroke can be admitted into the cylinders with the most ready and complete control, at any speed the engine may be going; if a high wind or an incline oppose the progress of the engine, a greater quantity of steam is admitted; if wind or gradients be favorable, the steam is still admitted at full pressure into the cylinders, but shut off at an earlier period, propelling the pistons the remainder of the stroke by its elastic force, similar to driving a time-piece by the uncoiling of the main spring.

Lastly.—A combination of dimensions and proportions have been gleaned from the best results of locomotive engines of various constructions, and in use in different parts of the country. The driving wheels are 6 ft. diameter, length of the stroke 2 ft. diameter, of cylinders 12 inches, inside dimensions of fire-box 2 by 3½ feet, tubes, 94 in number, by 9½ feet long, and 2 inches diameter. The general diminution of machinery in the construction has given room for ample dimensions in the principal working parts, and thus the whole arrangement has a close bearing on *safety*, *simplicity*, *economy*, and *durability* throughout.

Circumstances, however, too tedious to mention, led to those engines being ordered of Messrs. Shepherd and Todd, Railway Foundry, of Leeds, and the Hull and Selby line was opened with the engines of the former order, but the public and the company being so much annoyed by hot cinders from their chimneys, burning whatever they lighted upon, and rapidly destroying the smoke boxes themselves, three of those engines were altered, and succeeded to a considerable extent in diminishing the nuisance, whilst the engines performed better, and with less fuel. That fact, however, being questioned, and two engines of the *improved* construction having got to work, Mr. John Gray, the engineer of the locomotive department, and patentee of the improved engines, urgently requested a most rigorous and simultaneous trial of the different engines, and to be witnessed for the parties concerned by persons above suspicion. Mr. J. Miller and Mr. T. Bindsley represented Messrs. Fenton, Murray, and Jackson; Mr. J. Craven and Mr. J. Barrows represented Messrs. Shepherd and Todd; and Messrs E. Fletcher, W. B. Bray, J. G. Lynde, jun., J. Farnell, and J. Gray, were the representatives of the Hull and Selby Railway Company. The arrangements for the experiments were, that the gross load should include engine, tender, carriages, and every thing in the train.

The steam was got up in the respective engines to the pressure of from 56 to 66 lbs. per square inch; the fires filled to a certain level at the starting in the morning, and filled to the same level on finishing the last trip at night. The pressure of steam at starting was generally up to 66 lbs. and was at about half that pressure at the end of each trip. There were *fifty* experimental trips made in all, namely, twenty-four trips with the *Collingwood*, *Andrew Marvel*, and *Wellington*, the unaltered engines of Messrs. Fenton, Murray, and Jackson. Their average gross load was 53.4 tons, or 1,656 tons over one mile; consumption of coke 1,013 lbs., or 0.611 lbs. per ton per mile; water, 6,500 lbs., or 3 90 lbs. per ton per mile. There were ten trips made with the other three engines of Messrs. Fenton, Murray, and Jackson, which were altered at Hull, namely, the *Emily*, *Kingston*, and *Selby*. Their average load was 49.16 tons, or 1,524 tons over one mile; consumption of coke, 635 lbs., or 0.416 lbs. per ton per mile; water, 4,264 lbs., or 2.79 lbs. per ton per mile.

The *patent* engines made by Messrs. Shepherd and Todd, viz., the *Star* and *Vesta*, made sixteen trips, and their average loads, &c., were 55.4 tons, or 1,718 tons over one mile; coke consumed, 465 lbs., or 0.271 lbs. per ton per mile; water, 2,874 lbs., or 1.62 lbs. per ton per mile. The average gross load of all the fifty trips is 53.2 tons, or 1619·4 tons over one mile, and taking that as a standard load, the consumption of fuel and water performing exactly equal quantities of work, is represented in the following tables:—

Class of Engine.	Load in tons conveyed over one mile, in lbs.	Elsecar Coke used per trip of 31 miles, in lbs.	Coke used per mile, in lbs.	Coke used per ton per mile, in lbs.	Water used per trip of 31 miles, in lbs.	Water per mile, in lbs.	Water per ton per mile, in lbs.
Patent	1649.4	446.98	14.41	0.271	2672.	86.19	1.62
Altered ..	1649.4	686.15	22.13	0.416	4601.8	148.43	2.79
Unaltered..	1619.4	1007.78	32.59	0 611	6432.6	207.5	3.90

The financial annual result of the three classes of engines for coke and boilers, with such a traffic as that of the Hull and Selby line, will be about—

£4,500 for the unaltered engines,

£3,250 for the altered ditto; and about

£2,000 for the patent engines.

In conclusion, it is deserving of remark, that *all* the attesting witnesses expressed themselves highly satisfied with the manner in which the experiments had been conducted, and with the facilities which the company so readily granted to enable them to come at correct results. Probably no experiments were ever made under similar circumstances where the parties concerned displayed greater independence, impartiality, and good feeling than on the present occasion.—*Leeds Mercury.*

RESEARCHES ON THE RADIATION OF HEAT.

At the meeting of the French Academy, on the 23d November, M. Mellone read an important paper on a subject, the principle of which we have already alluded to, viz. the dispersion of radiant heat from the surfaces of bodies analogous to that of the diffusion of light. The following results at which he has arrived deserve to be recorded, as this part of physical science has lately acquired much interest.

First,—The surfaces of bodies act upon radiant heat in the way of dispersion, in the same manner as in the diffusion of light.

Second.—There are methods of distinguishing with certainty the calorific diffusion from the surfaces from the radiation which proceeds from the ordinary heat of bodies; though both radiations are equally composed of elementary rays, radiating in all directions from the centres of action.

Third,—Lamp-black produces an extremely small diffusion of heat, which is the same for all kinds of radiations.

Fourth,—The effect is very different with other substances, especially white ones, which have great power in diffusing the incandescent rays, and have little effect on rays of low temperature.

Fifth,—This peculiar property is sufficient to show that the phenomenon of calorific diffusion cannot be attributed to reflection, either regular or irregular; for that would act in the same manner on all degrees of heat.

Sixth,—The dispersive action of metals is, generally speaking, more intense than that of white bodies. It differs from the latter especially in its invariability; and in this respect it resembles the feeble diffusive property of lamp-black.

Seventh,—It follows, from the comparison between the phenomena of calorific diffusion and those of luminous diffusion,—1st, that lamp-black is a real black, both as regards radiant heat and radiant light: 2d, that white bodies act with regard to radiant heat in the same manner as colored substances in relation to light: 3d, that metals act in regard to calorific radiations in the same manner as white bodies on radiant light.

Eighth,—Diffusion reflects a part of the incident rays proportional to the diffusive power; and thus diminishes the calorific absorption by the amount of heat which has been dispersed from the surface. It is the same with specular reflection, in which the quantity of heat absorbed is diminished in proportion to the increase of the quantity reflected. The power of absorbing heat is, then, in inverse proportion to the reflective and diffusive powers; and no exact inference can be drawn respecting the amount of absorption, without taking into consideration the losses occasioned by the sum of these two powers. If it were attempted to calculate the quantity of heat which penetrates the interior of any substance, without taking into consideration the repulsive action of its surface, great errors would often be committed. Metals entirely lose their reflective power when covered with a sheet of paper, or are painted with white lead. Must it be, therefore, inferred that the coating of paper or paint absorbs all the incident heat? Certainly not; for those substances strongly repel different calorific rays by means of their dispersive powers, and retain those rays only which are indiffusible by the white surfaces; therefore the recognised law of reciprocity between the reflecting and the absorbing power of bodies is not correct. It has been attempted to show, by analogous experiments, the total absorption of radiant heat by lamp-black. A spherical or parabolical metal mirror, with its surface blackened, and then exposed to the action of the rays from a heated body, does not give any indication in its focus on the bulb of the most delicate thermoscope. It has been, therefore, inferred that lamp-black absorbs the whole of the incident heat. This, however, is an unsound conclusion, founded on two false hypotheses—the possibility of specular reflection from a surface completely without polish, and the non existence of calorific diffusion.

Ninth. — Thermoscopes and thermometers with ordinary bulbs, cannot indicate properly the comparison of the calorific rays, because certain kinds of heat pass immediately from one side to the other of the bulbs, without producing any effect on the enclosed air; or because these same rays traverse the interior part of the glass without heating it, undergo reflection from the mercury, and are emitted without having acted on the thermoscopic substance. It is therefore necessary to prevent the free transmittance by means of substances retentive of heat. But the greater proportion of these substances repel by diffusion different kinds of heat in varying degrees, and they cannot therefore be used to cover the bulbs of thermometers without the risk of falling into another source of error of the same kind. Therefore the retention of heat which is indispensible in thermoscopes, and in general to all instruments used in measuring radiant heat, ought necessarily to be obtained by applying on the surface of the instrument a coating of lamp black; a substance which, acting alike on different kinds of heat, and absorbing them all in the same proportions, is the only one capable of transmitting the heat to the thermoscopic body in the condition necessary to afford an exact measure of its quantity; whether it be by the expansion and contraction of fluids, or by the deviations which the thermo-electric currents give to the magnetic needle. For the same reason, the surfaces of thermo-electric piles ought not to be left in their natural metallic lustre; they must be painted black in order to give the thermo-electric multiplier that extreme sensibility and admirable quickness of indication which render that instrument so valuable in pursuing inquiry in the science of radiant heat.

These were the principal points dwelt upon by M. Mellone in his paper. M. Arago having made objections to some of the conclusions at which he had arrived, M. Mellone replied to the following effect. "If through a small hole in the window shutter of a darkened chamber light of different colors be admitted, and we look by means of these different rays of light at a disc colored white, and at another colored red, the first will appear *in every case* to be strongly illuminated; the other will become less visible as the light admitted contains fewer red rays. Thus the white disperses all kinds of light, the red disperses with energy only those rays of the same color, and absorbs differently colored rays; thus in certain cases the red disc becomes black, if its color and that of the light-giving ray are pure and distinct. Now experience proves that a white surface strongly disperses certain calorific rays, whilst it completely absorbs, (as much so indeed as a black surface) other heating rays; from this I conclude that in calorific phenomena white acts as a deeply colored substance in regard to luminous phenomena. M. Arago has said that, by means of photometric experiments of great delicacy he has proved that all whites are colored. That may be, but white does not become black under the direct rays of light, as it effectually does, in a thermological sense, under the action of certain rays of light. In the experiments mentioned, the white does not act like a faint tint of rose color or pale yellow, but like a deep red and a strong blue."

EXPEDITION OF THE FRENCH DISCOVERY SHIPS.

The *Moniteur Universel* gives the following sketch of the voyage of the discovery ships, the Astrolabe and Zelée, on their return home, from the time they set sail from Hobart Town. The ships have added materially to the knowledge of the coasts, and it is expected, that from the accuracy with which surveys have been made, the navigation of that dangerous part of the ocean will be now rendered comparatively safe:—

The expedition, under the command of Captain Dumont d'Urville, left Hobart Town on the 25th of February, 1840.

The voyage from that port to the Auckland Islands was longer than Captain d'Urville anticipated, owing to the light and changeable winds that prevailed. The expedition stopped nine days at the Auckland Islands, a time absolutely requisite to complete M. Dumont's observations in natural history, rendered more interesting from forming the completion of a series that he had made in the Antarctic regions. The plan of the islands and the harbour was taken by the officers, while the naturalists were pursuing their inquiries. Thus the limited range of organised beings in this part of the globe, which have hitherto been unknown, will henceforth be accurately described.

From hence M. Dumont d'Urville sailed towards the Snares Islands, afterwards from South Cape to Cook's Straits. The whole of the eastern coast was minutely surveyed. It is in that region that fifty or sixty of our whale vessels annually resort to fish. Much advantage will be derived by those ships from the results of this expedition, as it visited the ports of Otago and Akaroa, their principal anchoring places, and a plan was sketched of the two harbours.

The appearance of the discovery vessels, the Astrolabe and Zelée, produced a good impression. M. d'Urville was desirous of rendering his countrymen all the service in his power. At Otago he made over to the captain of the Havre, in order to reinforce his crew, which was weakened by desertions, two experienced sailors provided with necessaries. The task which M. d'Urville had imposed on himself ended at Cook's Straits, and time, which seemed to fly with rapidity during the incessant occupations of the expedition, obliged him to think seriously of returning. Yet he passed near many of the points he had discovered in his preceding voyage; he proved the exactness of his observations, and he sailed near that coast with as much security as if he had been near the coasts of Spain or Italy. The last voyage is remarkable for a dangerous sand bank, which it is of more consequence to be aware of as it is situated immediately in the passage from Touranga Bay (the Poverty Bay of Cook, and Tarn Roa Bay in the map of M. d'Urville), and at the present time this bay, in other respects dangerous, and in no way desirous for a long sojourn, is the only point of New Zealand where ships can obtain a supply of provisions. This is a fact which M. d'Urville experienced on the 24th day of April; but he sailed again the same evening, and he did well, for winds from the east, which succeeded the south-west winds, would have placed the two vessels in a very unsafe position.

At length they arrived at the Bay of Islands on Wednesday, the 29th of April. There M. d'Urville found the Catholic missionaries exercising their pacific ministry, under the direction of the Bishop of Maronnée, with simplicity, charity, and unbounded self-denial. As he had already done at Manga Riva, this officer hastened to grant them all the assistance in his power. On the morning of the 4th of May the expedition left the flat shores of New Zealand, and proceeded towards the north. On the 10th the Volcano Mathews was in sight, and on the 12th the ship began exploring the western side of the Archipelago Loyalty, which it had been impossible for M. d'Urville to reconnoitre on the preceding voyage of the Astrolabe.

This undertaking was entirely finished on the 15th, and M. d'Urville hastened to survey the shores of Louisiade. The discovery of these countries especially belongs to France, since Bougainville, and after him Entrecasteaux, were the only persons who had discovered the southern part. No other vessel had approached it, unless it were the Astrolabe, which discovered in 1827 the Cape of Deliverance, on the island of Rossel. Previously all the southern part had been very vaguely traced; the space between the point where the discoveries of Bougainville terminate and New Guinea, had remained entirely unknown; the generality of maps only designate this part by a strait of great extent.

M. d'Urville proposed to complete his geographical researches, by proceeding towards Torres Straits. On the 22d of May, the vessels anchored to the north of the Isle of Rossel, and from that day

to the 20th of May they continued to keep very close to the shore, tracing its variations with great accuracy, to an extent of nearly 200 leagues of coast. This navigation required great vigilance on account of the rough sea and violent winds from the S E. to the S.S.E., and the frequent fogs which rendered it impossible to discern at a distance the reefs of rocks which extend along the whole line of these shores. Yet, though, in consequence of unseen detached rocks, situated at a distance from the shore, M. d'Urville was obliged to be constantly on his guard, he successfully accomplished this expedition. On the 26th he ascertained that there was no strait between New Guinea and Louisiade, and consequently the large island of Estrecasteaux can only be the eastern extremity of New Guinea. This is an important fact to establish.

M. d'Urville also coasted along New Guinea for almost 30 leagues, beyond Cape Rodney; and near this Cape he found the face of the country as beautiful as any in the world. It would have offered a fine opening for exploration to vessels whose equipments had sustained no injury, and if there had been time to devote to it. But the captain had already exceeded the time allowed him, and he could not conceal from himself that it was high time to terminate his long voyage.

M. d'Urville then directed his course westward, to clear the Torres Strait by the most southern track. He chose this direction in order to make new geographical discoveries, knowing that Captain Wickam and several others had undertaken to explore the southern passage, almost exclusively frequented by English ships.

On the 31st of May and on the morning of the 1st of June, notwithstanding very violent winds from the S.E., and frequently very alarming fogs, the navigation of the Astrolabe and the Zelée was successful. M. d'Urville even expected to clear the strait on the following day, which by that track would have been an extraordinary voyage. But too much confidence in the imperfect plan sketched by Bligh, caused the failure of this expedition.

On the 3d of June, at three o'clock in the afternoon, they approached the island Warrior. The expedition had proceeded on a false tack, and M. d'Urville did not discover his mistake until it was too late to repair it.

The vessel cast anchor in three fathoms and a half on rocks of coral; the tide rising in the night broke the anchors and drove both the vessels on a reef of coral. At the ensuing sea tide the Zelée, which had been carried entirely on the reef, was found to have only six feet of water on the starboard, and four feet on the larboard quarter; but the Astrolabe remained suspended even on the edge of the rock with only two or three feet of water on the starboard, and from 12 to 15 feet on the larboard. Thus during the whole of the 2d of June this vessel remained in a frightful situation, which became so much worse towards nine o'clock in the evening, that for a moment M. d'Urville feared she must be dashed to pieces; fortunately the succeeding tide released her.

On the morning of the 3d of June, the Zelée was afloat again, and during the following night, by making desperate exertions at the capstan, the Astrolabe was released from her dangerous position, and was got afloat in a narrow strait, but where she was at least out of danger.

Many days were afterwards employed by these vessels in reconnoitring and carefully sounding the narrow and winding straits they were to pass through. At length on the 9th of June this labor was finished. The Astrolabe left the whole of her keels on the rock, but the vessel did not make a drop more water than before. Neither of the vessels lost their anchors nor cables, but several of the anchors had their flukes broken.

On the 12th of June M. d'Urville fortunately cleared the strait, after having terminated a discovery which will render this voyage as easy to those who may afterwards undertake it, as it has been difficult to himself. In order to procure provisions for the two vessels, he steered towards Coupang and Timor, where he arrived on the 20th of June, and from thence he sailed on the 26th with all his men in good condition, excepting four or five, who had been ill for some time. A strong breeze from the east made the vessels sail rapidly the distance which separates Coupang from Bourbon, where they cast anchor on the 22d of July.

Thanks to the measures adopted by the governor of the colony, these vessels were enabled immediately to replace their exhausted provisions, and to set sail on the 30th. The expedition stopped two days at St. Helena, for a supply of water. At this time, the 7th and 9th of September, they were impatiently expecting on that island the arrival of the Prince Joinville. All the preparations for the removal of Napoleon's body had already been made. On leaving St. Helena, the Astrolabe and the Zelée proceeded towards Toulon, where they arrived on the 6th of November. Thus is terminated with honor to navigation and advantage to science, one of the longest and most useful voyages round the globe that has ever been attempted. During the whole voyage the officers and sailors, supported by the example of their worthy chief, were equally zealous that the results should be satisfactory to the King, and answer the expectations of France.

MANUFACTURES IN THE NORTH OF FRANCE.

(*Concluded from our last.*)

The magnificent iron manufactories of Denin may be considered as specimens of metal working in the Department of the North. In this establishment are combined blast furnaces, refining and puddling furnaces, &c. The iron is taken out in bars in the state in which it is used. The proximity of the Scheldt renders the situation of this manufactory very favorable. Two of the blast furnaces are at work. These blast furnaces consume coke, and in general every thing is conducted on the most modern English plans.

The navigation on the Scheldt, which is so easy and attended with so little expense, has also had a favorable influence on works of a different kind. Glass works have increased in the neighborhood of Valenciennes. Many of these establishments have been formed on the model of the glass works in Belgium. It appears that they have extensive connections in the middle and in the west of France. Sugar refineries in this department have suffered considerably from the commercial policy adopted by France; yet some of those which had been previously formed are still in work. The necessity of diminishing the expense of the manufacture has occasioned the introduction of new apparatus. We will quote, for example, the apparatus for restoring the animal charcoal, in which this purifying substance is submitted to the action of steam of a very high temperature, an apparatus recently established at the sugar refinery of Crepin.

With respect to the railway that the Department of the North at present possesses, it forms the first portion of a railroad from Valenciennes to Douay. It commences at the bank which forms the left shore of the Scheldt near Valenciennes, and is carried on past Denin, towards Abscon. It is a single line of rails, and the road is very narrow. The curves are likewise not alluded to. But government has exacted a number of minute precautions from the company of Anzin, who have constructed and who are working this railroad. Not only are the signal men stationed very near each other, but the trains are obliged to diminish their speed as they approach the stations; *a flag must always be hoisted on the top of these stations when the road is free;* the engineers are obliged always to blow the steam whistle when they approach the stations.

These precautions imply a want of security on this railroad, which is injurious to the quickness of the speed, and almost to its safety. We cannot remark without astonishment that notwithstanding these precautions, notwithstanding the regularity of their arrival at the point of meeting, two of the usual trains a short time ago, when proceeding with great rapidity, struck against each other in open day.

We may further remark à-propos of this railroad of the company of Anzin, that the locomotives burn coke produced from a coal unfit for this purpose. This occasions a serious inconvenience to the passengers. The dust which falls upon them covers their clothes, their faces, their hands, and can scarcely be washed off. It is almost impossible to remain on that railroad in an uncovered vehicle. The dust which annoys passengers on the Belgian railroads, can convey no idea of the shower of ashes which covers these trains. In a pecuniary point of view, we must add that the price of fares is moderate, and that the company realise a very considerable income.

Such are the principal objects connected with the manufactures, which struck us when we had passed through the Department of the North. This part of Northern France is one of the parts of the country where manufactures have made the greatest progress. But we shall not have accomplished all our task if we do not dwell for a moment, before we conclude, on the more obvious and more important results of this increase of production.

The more the produce of a country increases, the greater is the population; this should naturally be the case, because there is thus a quantity of produce sufficient to satisfy the wants of a greater number of individuals. But this produce is obtained only by labor. When machinery aids the labor of man, production increases without any considerable increase of trouble and labor to man; he collects the surplus productions without having had the trouble of making them. Thus population increases in those departments where a great deal of machinery is employed. The population of the Department of the North amounts at present, according to the most recent official census, to one million and twenty-seven thousand inhabitants; it is a fourth of the population of Belgium. Comparing this number with the small extent of this department, we shall find that it contains one hundred and seventy-one inhabitants per square kilometre; which is nearly triple the average number of inhabitants per square kilometre in the rest of France. The Department of the North is of all the departments of France the one in which the number of inhabitants on the square kilometre is the greatest.

Every thing concurs in demonstrating this department to be one of the most important, the richest and most prosperous of that country.

BRITISH PATENTS.

SPECIFICATIONS OF ENGLISH PATENTS

ENTERED AT THE ROLLS CHAPEL OFFICE.

(*Continued from page* 341.)

EDMUND LEACH, of Rochdale, Lancaster, machine-maker, *certain improvements in machinery or apparatus for carding, doubling, and preparing wool, cotton, silk, flax, and other fibrous substances*, Nov. 28.—The first part of these improvements relates to an apparatus for oiling and greasing wool, which apparatus is attached to an ordinary cockspur teazer. The wool is delivered from the doffer cylinders upon an endless feeding cloth, and then introduced into the oiling apparatus, which is constructed as follows:—Two metal rollers are supported by the frame ends, the lower one revolves in a trough or vessel containing the oil, which is kept at a proper temperature by means of a steam chamber underneath. As the wool passes between these rollers it gets sufficiently greased by the oil being pressed into it. The supply of oil is regulated by means of a doctor-plate, which may be set or adjusted by an index being fastened by a set screw behind. The wool after passing between these rollers is taken up by the delivery rollers, from whence it is cleared, or beaten, by a toothed cylinder, revolving in a tin chamber.

Secondly.—A novel process whereby a number of slivers proceeding from a cree of bobbins, are wound upon a long bobbin, side by side, their edges being

made to overlap each other alternately, so as to form a continuous flat broad sheet of wool, &c. This is obtained by passing the flat slivers as they come from the scribbling engine, between grinders, bearing, or inclining, parallel to each other; which has the effect of overlapping the side or edges of the slivers, one above another, until they form a flat broad sheet, which then immediately passes on between pressing rollers, by which the slivers are driven forward through the grinders, and squeezed together into a single sheet. In this state they are wound upon a long bobbin, or spool, by friction with a revolving surface drum, and are in this sheet-like form ready to be conveyed to the last carding engine.

Thirdly.—The application of two or more pairs of feeding rollers, with their necessary clearers, and strippers, and driving gear, placed ono above another and immediately in front of or in the breast of the carding engine, by which means a considerable improvement in carding is effected, by dividing or separating the ordinary quantity of fibre, or sliver, into so many different thicknesses, and feeding it at so many places, instead of in single sheets, as is usual. By this means the sliver is much thinner at each point than by feeding it at once, and consequently the fibres are laid on more level and equally, as the operation of the carding is so much more effective.

Fourthly.—The application or arrangement of a curved bearing with plates, or elevated bearing surfaces of metal, or other smooth substance, placed in front of the doffers, for the purpose of supporting or carrying an endless twisting strap, or belt, such elevated bearings being placed beneath the strap or belt, and under each sliver coming from the doffers, by which mesns an equal pressure of the endless twisting strap upon each sliver is gained.

Fifthly.—In twisting the sliver into threads from off the doffers direct, (which doffers are of the description formed of annular rings and alternate blank spaces), without the action of a doffing comb; by which means the fibre is taken from the doffer precisely in the same stato in which it was laid on by the carding cylinders.

Sixthly.—In a number of small collars or pulleys being made to revolve on their axes by means of endless straps, and placed near each other, for the purpose of twisting, rolling, or rubbing the slivers into thresds by their being drawn between the approaching circumferences, and above the centre of such rollers, their circumferences being made slightly rough by milling or flutting.

Seventhly.—The application of rollers, or rollers covered with emery, or any rough material, and placed in front of or above the doffers of the carding engine, for the purpose of carrying on any sliver that may have broken, in order to facilitate the joining or piecing up of the same.

James Callard Davies, of College-place, Camden-town, Middlesex, jeweller, *an improved clock or time-piece*, Nov. 23.—This consists in the application of a train of watch-works to the fourth or last arbor of a train of clock-wheels, whereby a clock or time-piece may be constructed that will go for twelve months after having been wound up; also in placing the second or third wheel, or both of them, of the train of clock wheels before the front, or behind the back plate, by which means the clock may be made quite portable. It is also much simplified by having only two spring barrels, one for the going part, and the other for the striking part.

The barrel or box containing the main-spring is arranged for six revolutions, and carries on its circumference a large wheel, having one hundred and forty teeth. The second wheel has one hundred and ten teeth, and carries a pinnion of ten teeth on its arbor, which is driven by the first or large wheel. A third wheel is added with ninety teeth, this works on a pinnion having ten teeth, which passes through a hole made in the front plate, just below the circumference of the second wheel. This arbor and pinnion are secured in their places by means of two cocks, screwed one on each side of the front plate. The arbor of the third wheel is driven by the second wheel. After the clock-work portion of the time-piece is put together, a portion of watch-work is added, which we will now describe. The centre wheel is fixed by two screws in such a manner that a pinnion with nine teeth which forms its arbor, comes within the range of, and is driven by the third clock-work-wheel, to the motive power of which particular regard must be had. That being ascertained, and compared with that of the fusee wheel of any ordinary watch, will determine the proper size of the train of watch-work to be used.

Claim first.—The application of a train of watch-wheels, beginning at the centre wheel, to the arbor acted on by the third wheel of a train of clock-wheels, the centre wheel of the watch train being placed on the arbor as above described.

Claim second.—In placing the second or third wheel, or both of them, of the clock train, in front of the front plate, or behind the back plate, or at any rate outside of the case, so as to diminish the size of the time-piece.

Daniel Gooch, of Paddington Green, Middlesex, engineer, *certain improvements in wheels, and in locomotive engines used on railways*, Nov. 20.—These improvements consist in forming the outer or working surface of the engine and carriage wheels of steel, which may be made of any required degree of hardness.

A faggot of wrought iron bars is hammered or rolled into a solid piece, and afterwards drawn or rolled into a bar, having a flange formed at one edge. An indentation is then made longitudinally in the bar by a swage underneath the hammer, in order to prepare it for the steel.

A faggot of steel bars is so piled that when hammered their edges form the broad surface of a solid steel bar, and the grain of the metal runs in a contrary direction to that in the iron bar. The two bars are now heated to a welding heat, and laid together and welded, and afterwards drawn into a proper form. This compound bar is then made into a hoop of the required size, which is afterwards bored out and turned to the proper gauges, and holes made for rivetting it to the wheel. The wheel after having been prepared in the usual manner, is laid on the tire face plate, and the tire having been regularly heated red hot is put round it. The whole is then plunged into cold water, to contract the size, and harden the steel. Holes are drilled in the rim corresponding with the holes previously made in the tire, and the parts are then rivetted together. The inventor observes that he does not confine himself to the modes described of affixing the tire; and recommends that the metal used should be the best blister rolled, shear, or cast steel.

Claim first.—Mode described of forming and hardening tires of wheels to be used on railways.

Claim second.—The use of steel in the tires of engines and carriage wheels for railways.

NOTICE TO PATENTEES.

In accordance with the determination expressed in our last number to give Patentees *two months'* clear notice instead of *one month*, before the publication of their specifications, we now insert the names of the patentees whose specifications will be published in the "Inventors' Advocate," of Feb. 13, 1841. Each party will receive, in addition, a private communication to the same effect.

James Harvey, of Basing-place, Waterloo-road, due Jan. 8.

Louis Leconte, of Leicester-square, due Jan. 9.

Joshua Taylor Beale, of East Greenwich, due Jan. 10.

James Hodson, of Liverpool, due Feb. 3.

John Sanders and William Williams, of Bedford, and Samuel Lawrence Taylor, of Old Walden, Bedford, due Feb. 3.

George Edward Noon, of High Holborn, due Feb. 3.

William Saunders, of China-terrace, Lambeth, due Feb. 3.

William Beitson, of Brick-lane, Old-street, due Feb. 3.

Colin Macrae, of Cornhill, Perthshire, due Feb. 5.

Theophilus Richards, of Birmingham, due Feb. 5.

Henry Trewhitt, of Newcastle on Tyne, due Feb. 7.

Robert Sterling Newall, of Dundee, due Feb. 7.

Andrew Smith, of Princes-street, Leicester-square, due Feb. 7.

Thomas John Davis, of Bloomsbury-square, due Feb. 8.

Downes Edwards, of Surbiton-hill, Kingston, Surrey, due Feb. 8.

John Isaac Hawkins, of College-place, Camden-town, due Feb. 8.

Francis William Gerish, of Esst-street, City-road, due Feb. 8.

Samuel Howard, of Manchester, due Feb. 8.

AMERICAN PATENTS.

(From the "*Journal of the Franklin Institute.*")

For furnaces for smiths; Edward Nichols, Hampden, and James Anger, New Haven, New Haven county, Connecticut.

This is more properly a forge than a furnace, and is particularly intended for the burning of anthracite. In its construction it differs but little from such as have been before used. It consists of the chamber for containing the coal, and a wind chamber below this, into which the blast is to be blown. The whole is to be made of cast-iron, and the fire chamber is to be lined with fire brick; at the lower part of this there is a drop grate, by which the coals are allowed to fall into the wind chamber, and from this they are discharged by a close-fitting door. This door forms the bottom of the wind chest, and is connected to the drop grate by a jointed rod, in such manner as that the lowering of the door causes the drop grate also to descend.

The claim is to "the manner in which the drop door is combined with the grate; by which, when the door is opened, the grate is let down."

For a rotary steam-engine and pump; William H. Baker and Samuel H. Baldwin, Cohoes, Albany county, New York.

This instrument, which is to be used either as a rotary steam-engine, or as a pump, is to operate in the same way with such as have been before essayed. Two cylindrical segments are to revolve within a case having concave ends exactly adapted to them; each segment is about a semi-cylinder, and on its axis is another semi-cylinder of half its diameter. By gearing upon the axles, on the outside of the case, these segments are made to revolve with equal velocities, and in such manner as that the larger cylindrical segment of one has its face in contact with the smaller segment on its fellow. So far the plan is old; the claims point to what are esteemed the novelties in the improved construction, and these are to "the mode of keeping the joint tight between the segment pistons as they revolve, by means of the segment or cam gearing on the axles of the segment pistons, which gives to the pistons equal velocities as they revolve; and to the arrangement of the parallel metallic packing against which the segment pistons revolve, regulated by screws from the outside ot the chamber, in combination with the hemp packing at the sides of said metallic packing, as described."

FOREIGN INTELLIGENCE.

FRANCE.

Tho Academy of Sciences, at a recent sitting, came to a decision in favor of tho Marquis de Jouffroy's plan for propelling steam-ships, which was noticed in a late number of the Inventors' Advocate. This plan consists in substituting for

the paddle wheels at the side of the vessels, jointed pallettes, in the form of swan's feet, placed below the vessel, and acting altogether under the water, by working backwards and forwards. After some objections had been urged to the favorable report of M. Cauchy, the Academy came to the resolution of admitting the advantages of the new plan, and judged it worthy of approbation. This resolution, though apparently of not much importance, is considered to indicate, on the part of the French Academy, a determination to pursue a different course in encouraging and promoting discoveries and inventions from their former over-cautious mode of proceeding. The judgment of the Academy has, in this instance, been formed from theory and scientific experiments, instead of waiting till the success of the plan has been proved on a large scale; that is to say, it has preceded, instead of following, public opinion; and has thus taken the position which such an institution ought to occupy. It is well observed, by the learned reporter of the proceedings of the Academy, in the *Journal des Debats*, "what is the object and the use of learned bodies and academies of science, if they persist in the timid plan they have hitherto too much pursued, of refusing their encouragement and support to discoveries until they have received the sanction of experience and practice? We know of more than one admirable discovery which has been lost from the inability to try it on a large scale, without the assistance of the representatives of science. As to those which have answered all the conditions proposed on their announcement, they do not require the countenance of any of the learned societies in the world, from which they have then nothing to demand. The support given to the plan of M. Jouffroy establishes an important precedent in the judgments given by the Academy of Sciences."

There is now exhibited in one of the galleries of the Louvre a model of St. Peter's at Rome, with its grand colonnade, executed and inlaid with specimens of the woods of all parts of the world, forming a work of art worthy the notice of the artist as well as the amateur. The vaults on which the basilic is raised, the side-chapels, the columns of the confessionals, the paintings which adorn the cupola, the details of the ornaments of the lantern, the ball, and the cross by which it is surmounted, in fine, all the most minute points, are rendered with the most exquisite taste and exactitude. The statues of the tombs are in ivory—the mosaics are represented by diminutive paintings on copper—the columns, altars, steps, pavements, and cornices of variegated marbles are imitated in various colored woods resembling jaune antique, porphyry, &c. The soffits, which are copied with the most accurate proportions, are gilt. In short, there is not the most minute detail which persons the most intimately acquainted with this splendid monument of architecture will not find fully and faithfully copied. This beautiful and ingenious piece of work was executed by Andrea Gambassani, of Leghorn, who was engaged upon it for fifteen years. It has been visited by the King and the Royal Family.

COMMERCIAL TREATY WITH FRANCE.

The *Presse* says, "We are assured that the recal of the English commissary, charged with the overtures relative to the treaty of commerce between France and Great Britain, was marked by a political character which deeply affects the pending negotiations. It is easy to comprehend in part that, in the state of dissension between the two nations, questions of great gravity absorb secondary interests; thus, for three months the treaty, which the Ministry of the 1st of March had announced as being virtually concluded, has been entirely set aside."—The *Times* gives the following additional explanation. "We believe the true state of the case to have been briefly this:—Mr. Porter having concluded that part of the negotiations relative to the commercial treaty with which he was charged, jointly with Mr. H. Lytton Bulwer, was preparing to return to London, when he was requested by M. Thiers to delay his departure, in order that, if affairs assumed a more conciliatory aspect between the two countries, the French Cabinet might give its formal accession to the treaty. Mr. Porter accordingly remained in Paris six weeks longer, and at length finding the French Government did not make any fresh overtures, returned to London to resume the duties of his department."

RAILWAY INTELLIGENCE.

DOMESTIC AND FOREIGN.

London and Birmingham Railway.—Keeping in view the fact, that the managers of this company had to get together their large establishment at a period when there were fewer facilities than now exist for securing men of experience—that, in short, the whole corps of servants were of necessity wholly unacquainted with railway practice—the absence of any fatal or very serious accident to any one of the millions of passengers that have traversed the line (as deposed to at the inquest by Mr. Creed), is not only altogether unprecedented, but absolutely marvellous. Scarcely less wonderful, and equally expressive of the excellence of the system adopted in the working of this line, is the fact (which we have from unquestionable authority) that, from the 1st of January last to the 1st instant, with nearly thirty trains daily, not one accident has occurred to any one of them, nor has a single passenger been in the slightest degree injured!—*Railway Times.*

Railway Communication with Ireland.—The *Liverpool Standard* states, that the Grand Junction Railway Company have received an official communication that the Irish mails are shortly to be conveyed *viâ* Chester and Holyhead, instead of by Liverpool, as at present. The Railway Company would convey the mails to Chester. In that case, the proposed line to Holyhead will probably be made.

Extension of the Great Western Railway.—It is confidently expected that the time of travelling from Devonport to London will be shortened several hours before Midsummer next. The directors of the Great Western are making liberal offers to some of the contractors to finish their works before the time specified in their contracts, in order to get the whole line completed by the 1st of June. The Bristol and Exeter will be opened as far as Bridgewater about April or May, so that there will be only eighty-six miles by horse conveyance from London to Devonport.—*Plymouth Paper.*

The Intended London and Manchester Railway through Leicester.—The *Herts Reformer* says:—"This line is intended to commence at the Regent's Canal, near Battle-bridge, at which place it will unite with the London Grand Junction Railway, for which an act has been passed; by this means a terminus at Skinner-street, Snow-hill, close to the Post-office, and in the very heart of the city, would be obtained; from Battle bridge the line proceeds to Crouch-end, near Barnet, St. Albans, Luton, Ampthill, Bedford, Kettering, Market Harborough to Leicester, being a distance of 91 miles. The engineering works on this division are necessarily rather heavy, as far as Bedford, although there are no obstacles which may not be readily overcome by the usual means; neither are the cuttings, embankments, or other works greater than those on several lines now in operation. The steepest inclination does not exceed 20 feet per mile, with the exception of the first four miles out of London, which is one in 200; this, it will be observed, is much more favorable than the Birmingham line, which, in order to effect the same distance out of London, has an inclined plane, worked by a stationary power, and a tunnel through Primrose-hill, nearly a mile long. From Bedford to Leicester, the line would be of a much lighter description. With the exception of a part of the line from Bedford to 15 miles south of Derby, sections of the road have been made, but it is necessary the surveyors or engineers should again go over what they have done, and define the exact line they will take, that the land owners and the agricultural interest may know in what manner they will be affected by it ere called upon to take shares. Funds have been raised to complete the surveying expenses; and the engineer of the company, Mr. Remington, is now making his plans and sections, in order to comply with the standing orders of the House of Commons, by having them deposited, as directed, before the 1st of March next."

The Directors of the Newcastle and Carlisle Railway Company, we understand, resolved, at their meeting on Tuesday last, to make the line a double one throughout its length, as soon as convenient—a determination which the public will learn with much pleasure.—*Tyne Mercury.*

The Great North of England Railway.—The great quantity of rain which has fallen within the last few weeks, has necessarily delayed the opening of this railway, which, it will be recollected, was advertised to take place on the 26th Nov. It is now understood that the opening will not take place till the beginning of the year.—*Tyne Mercury.*

RAILWAY ACCIDENTS.

Verdict of Murder and *Felo-de-se* against an Engine-driver, and a Deodand of £2,000.—The inquest on the bodies of the men Dawson and Simpson, who were killed by the recent collision on the London and Birmingham Railway at Harrow, was brought to a conclusion on Wednesday. Quinlan, the stoker of Simpson's engine, was sufficiently recovered to be examined, and his evidence was most conclusive against Simpson, whose recklessness, as exhibited by Quinlan, induced the jury to return a verdict of Wilful Murder against him as regards Dawson, and of *felo-de-se*. The heavy deodand imposed on the engine seems scarcely justified by the evidence. The following is the substance of Quinlan's statement, which refers to previous gross misconduct on the part of Simpson.—I have been employed as a stoker about two months on the London and Birmingham Railway. I had been for two years before in the employ of the company, and worked in the sheds belonging to them. Latterly I have been fireman to Simpson. I was with Simpson one day in the month of September last, when a bullock jumped over one of the cattle wagons by the train. The bullock fell over on to the line, and lost his horns by the occurrence, but was not killed. No other accident happened during the time I was with Simpson as fireman, until the late fatal one near Harrow station, except that on one occasion a red board was put up between the rails at the Harrow station for Simpson to pull up, *but he did not do so.* This was after the bullock affair, but I cannot say how long since. The board upon that occasion was raised in height about five feet. *In our progress we knocked it down into the ashpit of the line at the station, and passed over it.* We could see that signal about two miles off in a straight line. The signal was then hoisted for us to stop because one of the metals was off the rail further down the line. On the afternoon of Thursday, the 12th of last month, I set out from Wolverton for London with Simpson, Joseph Dawson, and Martin Brown. Martin Brown had charge of engine No. 1, and Dawson was with him. I was with Simpson on No. 82 engine. The train was attached to our engine, and No. 1 was immediately in front of us and attached to the same train. On our arrival at Boxmoor station, the policeman on duty there told us to go on to Harrow station gently. Simpson became flurried and angry with the policeman because he had stopped him. I saw the red signal above half a mile before reaching Harrow station. I told Simpson I saw it, and cautioned him to let the steam off. He turned it off until he got it down to about an inch, in which state he continued to keep it. The full force of the steam is four inches in depth, so that at this time Simpson let off three-fourths of

the power of his engine. Martin Brown, of No. 1 engine, give a signal by lifting the valve, which he continued to do as we approached Harrow. Although Simpson let off three-fourths of the steam, the fourth that remained was enough to keep the wagons in full swing, as, from the point where the red light was first seen, the line was all down hill.

Coroner.—When you saw the red light continuing up at the station, and the train still going on, did you speak again to Simpson?

Quinlin.—I did; I told him a second time to let all the steam off, but he took no notice of me whatever, and did not do so.

Coroner.—Did you observe whether he saw the signal light or not?

Quinlan.—Yes, he looked straightforward at it.

Coroner.—Do you recollect passing the policeman as you approached the Harrow station?

Quinlan.—I do perfectly well. He hallooed to us to "hold on."

Coroner.—Did Simpson make any answer to that shout?

Quinlan.—None that I could hear. I did not see that he did anything. I kept holding on at the break all the time of my own accord. I then perceived that we were coming close upon an engine, I believe Bradburn's, on the line before us, and thinking there was not a moment to be lost, I shifted to the other side of the engine and jumped off.

Coroner—Did you say anything to Simpson before you found it advisable to jump off the engine.

Quinlan—I said to him it is time for us to be jumping off now, but he said nothing whatever to me in reply.

The court was then cleared of strangers, and after a discussion of nearly three hours again opened, when at twelve o'clock the foreman read the following special verdict:—

"We find a verdict in the case of Wm. Dawson 'Wilful Murder against Joseph Simpson,' and in the case of Joseph Simpson '*Felo de-se.*' We impose a deodand of £2,000 on the engine and tenders No. 15 and No. 82.

"With respect to Bradburne, the jury have felt considerable difficulty in not agreeing to a verdict of manslaughter, and they beg to express their sense of the great impropriety of his leaving his engine without putting it on the siding, and of his leaving it at all in the situation which proved so dangerous."

Mr. Rotch, the foreman, then read the following observations of the jury:—

"The jury cannot conclude their labors without expressing their surprise and regret at the manifest inefficiency of the executive of the company as connected with the matters that have come before them in this inquiry. The directors seem to have passed and printed many excellent rules and resolutions, which have been neglected to be carried out and enforced, while in some instances printed instructions have been given to a class of men unable, for want of education, to read them; and in some cases persons appear to have been put on as drivers of engines, having the whole conduct of the trains, without being duly qualified for the purpose.

"The jury consider great blame is attributable to the directers for continuing in their service such a reckless driver as the unfortunate man Simpson; and they are forcibly struck with the ignorance of the executive of the numerous acts of disobedience and wanton carelessness on his part, which have been produced before them in evidence.

"Considering the immense importance to the public of safe conduct in a mode of conveyance over which they are deprived of all control, or, when in motion, even of the power of remonstrance or complaint, and are entirely at the mercy of the engine driver, the jury feel the public have a right to expect *that some person of superior education and attainments as an engineer should be appointed as a* CAPTAIN *of each train, to proceed with it and conduct it to its final destination.* The night signals are evidently insufficient, and yet no efficient means seem to have been adopted to improve them, while it is evident that no security can be attained until a means of communication between the guards and the engine drivers is established. To all which matters the jury feel it is the bounden duty of the directors to turn their immediate and earnest attention."

This verdict excited a very extraordinary sensation throughout the court.

The Coroner then said, that in consequence of the verdict that had just been returned, the inquisition would occupy a considerable time, so as to be drawn up with the requisite care and exactitude. He was, therefore, under the necessity of requesting the gentlemen of the jury to come again on a future day for the purpose of signing the inquisition. After the inquisition had been conducted with so much ability and exemplary patience, it would be truly lamentable if the object that they had chiefly sought should be frustrated by not having the inquisition properly drawn up, and they must have seen how inquisitions had been set aside upon what he must call frivolous pretences.

Mr. Jago then addressed the Coroner on behalf of Lord Northwich, the lord of the manor, and put in the following extraordinary claim to the deodand:—

TO THOMAS WAKLEY, ESQ., M.P., CORONER FOR THE COUNTY OF MIDDLESEX.

Sir,—As agent for the Right Hon. John Lord Northwich, lord of the manor of Harrow, otherwise Sudbury, otherwise Harrow-on-the-Hill, I do hereby claim for him, and on his behalf, all the rights, profits, privileges, and immunities secured to the lord of the manor of Harrow by charter granted in the reign of King Stephen, and which charter, rights, profits, privileges, and immunities were extended and confirmed by very many of the succeeding Kings, by Queen Elizabeth, and further confirmed in Michaelmas term, 19th of Charles II., and enrolled in the Treasurer's Remembrance-office and in the Court of Exchequer. The recital of such charters and confirmation of same would run to a very great length, and I respectfully conceive is not necessary for the purpose of making the claim of the lord of the manor of Harrow before you at this time of all the rights, privileges, profits, and immunities so granted and confirmed as aforesaid, and set forth in the exemplification of the said claim enrolled in the Treasurer's Remembrance-office and in the Court of Exchequer aforesaid. And I do further claim, on the part of the lord of the manor, the deodand of £2,000, now found by the jury, and the lord will prosecute such claim before the Court of Exchequer.

I have the honor to be, Sir, your obedient servant,
R. H. JAGO.

74, Great Queen-street, Lincoln's-inn-Fields,
December 2, 1840.

THE LAW OF DEODAND.

A correspondent of yesterday's *Morning Post* affirms that the verdict given by the coroner's jury, at the Harrow inquest, is inconsistent with the law of deodand. This writer says, "a deodand being when a moveable thing inanimate, or beast animate, doth move to or cause the untimely death of any reasonable creature, by mischance, without the will or fault of himself, or of any person (*vide* 3 Inst. 57), the attaching one to cases of death by wilful murder and *felo-de-se*, as found in the same verdict by the jury on the late inquest at Harrow, is a contradiction in terms, at least, of law."

ACCIDENT ON THE EASTERN COUNTIES RAILWAY.—On Tuesday, an accident, which might have been attended with serious results, occurred on the Eastern Counties Railway. The train left Brentwood at 3 o'clock, p.m., and proceeded to within a mile and a half of the Stratford station, when the attention of the passengers was called to an uneasy jumping motion of the carriages; repeated concussions were heard, and at length it was ascertained that the tender and a second-class carriage next to the tender were both off the line. The engine-driver must certainly have used great caution and skill in gradually stopping the train, otherwise the whole of the carriages must have been overturned. The guard, who was upon the roof of the carriage, was in a very perilous situation, and was compelled to hold on with all his strength. On inspecting the line afterwards it appeared that the tender must have travelled off the line at least half a mile, and no less than 60 or 70 of the iron chairs which support the rails had been broken, so that one line would be rendered useless for a short time. Notice was sent down to Romford to place the 5 o'clock up-train on the other line, and in due time it appeared on its way to Stratford; and, although the police showed the red light (the signal to stop), the engine-driver and guard continued their course without any regard to the signal.

FATAL ACCIDENT ON THE BLACKWALL.—On Friday se'nnight, George Walton, who was employed on the London and Blackwall Railway, and who was a foreman of a gang of navigators, met with his death on the railway, near the West India Dock station. He was at work at the time that the up Blackwall train was approaching, and was in a stooping position, when he was struck on the head by the lamp-iron of the first carriage, which knocked him down between the rails under the rope, and the other carriage passed over him. On being taken up life was extinct. The body was conveyed to the West India Dock station, where it awaits the coroner's inquest. Some of the men are in the habit of boasting how close they can stand by a train as it passes. A short time ago one of the workmen who used to venture to touch them as they passed, had his arm broken, and came out of the London Hospital only a few days ago.

ANOTHER ACCIDENT ON THE YORK AND NORTH MIDLAND.—On Wednesday se'nnight, as the mail train from London was approaching Leeds, an accident occurred which was productive of very considerable damage to the carriages forming the train. It seems that when the train approached the junction of the York and North Midland Railway with the North Midland line, on which it was running near to Normanton, owing to the imperfection of one of the self-acting swivels, the points of junction had not been duly adjusted, and the consequence was that, although the engine and tender took the correct line of road, the whole of the carriages following took the route of the projecting line. Of course they did not go far in that direction; carriage after carriage was pulled off the line by the force of the engine which still continued its course, and as each carriage was pulled off it was overturned, and greatly damaged. Great injury was also done to the rails, which were torn from the stone foundations and broken. Some half dozen carriages were overturned, and the passengers were thrown out, but none of them were injured. We understand that the engine proceeded two or three hundred yards before it was brought to a stand. The damage is estimated to amount to nearly £1,000.—*Leeds Intelligence.*

EXPLOSION OF GUNPOWDER IN TUNNELING.—Another fearful accident occurred on Tuesday, at Danford Bridge, about three miles from Holmfirth, in a portion of the tunnel now forming, connected with the Sheffield and Manchester Railway. The precise cause of the melancholy disaster is somewhat obscure. It appears, however, that six men were employed in "blasting," and that a large quantity of gunpowder employed in the operation suddenly exploded before they had time to withdraw from the spot. The consequence was, the immediate death of all present. The mangled bodies of these poor fellows presented a shocking and horrible spectacle, in each of them life being utterly extinct.—*Leeds Paper.*

ENGINE WHEEL ON FIRE FROM FRICTION.—On Saturday night, as the up train on the Birmingham and Gloucester Railway, from Cheltenham, had got a little way on this side of the Defford station, it was discovered that one of the wheels of the engine had taken fire owing to the friction generated by the rapid motion. Great alarm prevailed amongst the passengers in the train, which was first propelled back to Defford, next to Eckington, and then to the Bredon station, before oil could be obtained to apply to the burning wheel.—*Worcester Chron.*

CONVICTION FOR WANTON MISCHIEF.—At Chelmsford quarter sessions, on Wednesday, Josiah Tho-

rogood, described as an auctioneer, was found guilty of having turned on the steam of a locomotive engine, which was left standing on the Eastern Counties railway at Brentwood. It appeared that between twelve and one o'clock on the morning of the 22d of September one of the engines which had during the evening come down from London with the train, was at the terminus at Brentwood, but sufficient steam was left in the machine to propel it if turned on. The men in the night were alarmed by a whistle proceeding from the engine, and on going to the spot found it proceeding, very fortunately, in the contrary direction to London; but it had come into collision with, and had dashed to pieces, a horse coal carriage and a coal truck, and these had impeded its course. The prisoner, who had evidently been thrown from the engine by the collision, was found upon his hands and knees on the line of railway, and upon being questioned as to the right he had to be there, and what he had been doing, he said that he had tried to reverse the engine; the effect of which would have been that it would have proceeded with frightful rapidity twards London, and might have caused most serious loss of live. The prisoner was sentenced to be imprisoned for six months and to pay a fine of £5. It was intimated that the sentence would have been more severe had not the counsel for the railway company stated that they did not wish to press for a severe punishment, as this was the first offence of the kind.

Thirty-five Sheep Killed.—On Sunday night, as a train on the Great Western line was running between Bull's-bridge and Hanwell, it actually passed over 35 sheep, the whole of which were destroyed. The train was not materially interrupted.

THE FALL OF A RAILWAY VIADUCT.

To the Editor of the "Inventors' Advocate."

Sir,—As I feel assured you will be thankful for any information which your readers can supply for the accuracy or correction of notices given in the Inventors' Advocate, I beg to offer an observation upon your railway intelligence of last Saturday's paper, under the head of "*Fall of a Viaduct on the North Midland*,"—which, however, is not the case, as the accident mentioned in the *Advocate* happened on the Midland Counties Line, near the "*Wigston Station*," at a place called "*Crow-mills*," about four miles from Leicester, on the Rugby side of our borough. I viewed the spot on the Thursday after the accident, when it was expected they would be able to clear the canal and again free its traffic from all impediment. Hitherto no cause for the failure has been made public; fortunately the luggage train had passed safely over about two minutes before the fall, and the canal boat had similarly escaped disaster; so that the chief sufferers I look upon it will be the company and their contractors.

I am, dear sir, your very obliged friend,
Leicester, Nov. 30, 1840. A Constant Reader.

FOREIGN RAILWAYS.

Indemnity for Damage by Fire caused by a Locomotive.—The Police-office at Vienna has condemned the company of the Northern Railway to pay 130,000 florins as indemnity for the damage done by fire to the village of Gänserndorf, assuming it to be proved that the fire was occasioned by sparks issuing from the funnel of the engines attached to a train. A further fine of 500 florins was imposed on the company for having infringed the police regulation, which prohibits the use of wood for fuel in the engines, on account of the danger accruing from the sparks. The company has appealed against this decision to the Regency of Lower Austria.

The Paris and Rouen Railway.—The Council of Administration of the Paris and Rouen Railroad Company has published a letter stating that, through the active surveillance of the administrators of the company resident in London, the amount of the second payment of the shareholders in England, which the house of Messrs. Wright and Co. had been commissioned to receive, and convert into Exchequer bills, was actually so converted before the house stopped payment, and that therefore the company will not sustain any loss.

APPLICATION TO PARLIAMENT FOR RAILWAY ACTS.

The following are the principal notices applicable to railways, which have appeared in recent numbers of the *London Gazette*:—

Durham and Sunderland Railway.—To enable the company to raise a further sum of money.

London and Croydon Railway.—To alter, amend, and enlarge some of the provisions of previous Acts. It is added, that "this notice is given by way of precaution that the company may not be precluded from applying to Parliament in the ensuing session, in case it should hereafter be deemed necessary."

London and Chatham Railway.—To make certain deviations in the proposed line from London to Chatham.

London and Greenwich Railway.—To alter, amend, and enlarge the powers and provisions of previous Acts. The notice is given by way of precaution, as in the case of the Croydon Company.

London and South-Western Railway.—To alter, amend, and enlarge the powers and provisions of previous Acts.

London and Blackwall Railway.—To alter, amend, and enlarge certain of the powers and provisions of previous Acts, particularly to enlarge the period for the re-sale of superfluous property, and till such sale to authorise the raising of money by mortgage or lease of such property.

Midland Counties Railway.—To alter, amend, and enlarge the powers and provisions of the previous Acts. There is a statement appended, as in the case of the London and Croydon, stating that the notice is given by way of precaution.

North Midland and Doncaster Railway.—To make certain deviations in the proposed line from Doncaster to the North Midland Railway.

Northern and Eastern Railway.—To alter, amend, and enlarge some of the powers and provisions of the four previous Acts.

North Midland Railway.—To alter, amend, and enlarge, or repeal, some of the powers and provisions of previous Acts, and to enable the company to lease or purchase the Leeds and Selby line, either alone, or jointly with the York and North Midland Railway.

Preston and Longridge Railway.—To enable the company to raise money for defraying the expense of completing the railway.

Swansea and Loughor Railway.—To make a railway in Wales.

Thames Haven Railway.—To alter, amend, and enlarge the powers and provisions of the original Act, and particularly to extend the respective periods for taking property and completing the works.

West London Railway.—To repeal, alter, amend, and enlarge some of the powers and provisions of previous Acts, and to increase, vary, or alter the tolls, rates, or duties authorised by the original Act of Incorporation.

West London Railway Extension.—To make the extensions to Knightsbridge and the Thames.

York and North Midland Railway.—To alter, amend, repeal, enlarge, and extend some of the powers and provisions of previous Acts, and to effect the lease or purchase of the Leeds and Selby line, either separately or in conjunction with any other company.

Comical Errors of Translators.—The *Moniteur Industriel*, in translating a paragraph from an English paper, relative to some works undertaken by Mr. Stephen*son*, the celebrated engineer, speaks of that gentleman, as Monsieur Stephens *fils*; which signifies in English Mr. Stephens, *junior*. A correspondent of the *Times*, writing from Nuremberg, talks of a piece of sculpture representing the "English greeting" instead of the "Greeting of the Angels," the word in German for English and angels being the same.

GENERAL COMMISSION AND PATENT AGENCY FOR IRELAND.

We beg to recommend our AGENT for IRELAND, Mr. RICHARD TELFORD, 109, STEPHEN'S GREEN, DUBLIN, as the most eligible person whom PATENTEES can employ for the sale of their articles in Ireland. He has a most extensive and respectable connection, and his house is well known as a depôt for patent goods, inventions, &c. We have no doubt of his efficiency to promote the interest of those parties who may favor him with their business.

Mr. Telford also undertakes every description of Patent Agency business for Ireland.

TO CORRESPONDENTS.

The suggestions of "C. N." from Cumberland, *shall be attended to.*

The description of the invention, alluded to by "An Engineer," *will be given next week.*

"An Inventor" *is recommended not to show the drawings or description, unless he is quite sure of the probity of the party.*

Gratuitous Copies *of our Journal have been forwarded to a number of Individuals interested in some Patent or Invention, of which notice has been taken in our number of to-day.*

"The Inventors' Advocate" *is published every* Saturday Morning, *at* 7 o'Clock; and is regularly issued in Monthly Parts, of which 1 *to* 17 are now Ready.

"The Inventors' Advocate" is also published in Volumes containing the Nos. of every 6 months.

Vols. 1 and 2, handsomely bound, are already published.

TO INVENTORS.

PERSONS WHO WISH TO OBTAIN OR DISPOSE OF PATENTS, *or to bring* NEW INVENTIONS INTO USE, *are requested to apply to the* PATENT OFFICE, BRITISH and FOREIGN, No. 198, STRAND, *opposite St. Clement's Church, where they will meet with great facilities to obtain information and to carry out their views.*

THE GALLERY OF INVENTIONS,

Attached to the Patent Office, is a spacious Saloon, well lighted, in which Plans and Models are exhibited. It affords an excellent medium for bringing New Inventions into public notice.

TO CAPITALISTS, MANUFACTURERS, AND TRADERS.

Among many VALUABLE INVENTIONS *and* PATENTS *registered at the* PATENT OFFICE, BRITISH and FOREIGN, (198, Strand), *for the investment of capital, Shares are offered for sale in the following Useful Inventions:—*

A Fire Escape of Novel Construction, which may be used as an Observatory.
A Cheap Lamp for burning Tallow and Grease, without overflow or smell.
Patent Screw Jack, for lifting locomotives and other great weights.
An Improved Balance, applicable to small or great weights.
Important Improvement in Wood Paving.
A New and Improved Method of Burning Coke.
New Methods of Purifying and Treating Oils.
A new System of Clock-making.
Patent Forge Back.
A new Castor for Furniture.
Patent Process for the Manufacture of Soda.
Improved Methods of Building Iron Ships.
The Purification of Gas.
Improvements in Soap-making.
An Umbrella, in imitation of a Malacca Cane.

THE
INVENTORS' ADVOCATE,
AND
JOURNAL OF INDUSTRY.

SATURDAY, DECEMBER 5, 1840.

*** *The Office for the publication of* The Inventors' Advocate, *is removed from Tavistock Street, Covent Garden, to the Patent Office, British and Foreign,* 198, *Strand; opposite St. Clement's Church.*

There is a very crude attempt now making to promote the manufactures of Ireland, by self-imposed, or compulsory, resolutions to purchase the manufactures of that country; though the same articles, both cheaper and better, of English make, can be obtained. These attempts to give a fictitious value to inferior goods, has the same effect, to a limited extent, as protective duties; without having the advantage, which protective duties possess, of being enforced on all members of the community alike. The policy of imposing duties even on foreign goods, as a means of protecting the home manufacture, is at all times questionable, but when one division of a kingdom attempts to encourage its manufactures by imposing restrictions on the manufactures of another, the policy which was in the former case questionable, becomes decidedly injurious.

Protective duties are only defensible in the cases of newly-formed manufactures, which require the fostering hand of the government to bring them to perfection; or in those products whose cultivation employs a large portion of the population, and which, owing to the peculiar circumstances of the country, cannot fairly compete with the foreign cultivator. Yet, even in these cases, the policy is questioned, and experience has proved, that when the protective duty has been removed, the effect has been to give an additional stimulus to the emancipated manufacture which was supposed to require protection, and to enable it not only to compete with the foreign producer in the home market, but even to enter into rivalry with him abroad. The system of affording protection to any branch of manufacture almost invariably produces lethargy in the manufacturers. They know that the home market is secured to them whatever be the quality of the goods they produce; and this feeling prevents them from exerting their energies, which must be called into play when a powerful competition threatens to destroy their business if they be not constantly improving the quality of their goods. The silk manufacture of this country affords a striking illustration of this fact. From being a weak exotic which the tenderest care and most rigid protection could scarcely keep alive, it has, since the trade was thrown open, become one of our principal manufactures, equalling, if not exceeding, the great staple manufacture of woollens.

If any branch of manufacturing industry will not thrive without continued protection, after a fair trial, it is evident that there is a waste of the resources and energies of the people in endeavoring to uphold it. The expense and risk of conveyance on foreign goods, the extra charges requisite to make a suitable return, and the duty imposed as a source of revenue, afford a sufficient protection in most cases to the home manufacturer; and if the advantages he possesses in supplying the home markets are not sufficient to enable him to rival the foreigner, he had better turn his attention to some other business more suitable to the circumstances of the country and to the genius of its laboring population. To pay a larger sum for an article of home produce than the same can be purchased for of foreign manufacture, with all the delays, charges, and risks with which it is encumbered, is not only a loss to the purchaser but a loss to the country also. It shows that labor and capital have been wastefully employed in making goods which can be bought cheaper from foreign manufacturers, whilst other goods can be made here with a greater advantage to sell for a profit abroad. The bugbear of the balance of trade has for some years past ceased to be so alarming as formerly, and the people begin to know that the wealth of a country is indicated by the amount of its imports as much as by the quantity of exports. If the exports were to be materially diminished, its imports would diminish in proportion. The difficulty of making payment for the goods imported would raise their price, and the home manufactures would again compete successfully with the foreign.

The case, it is true, is somewhat different in Ireland; where there is a large impoverished population, whose principal articles of export are the live stock and provisions of which they have themselves so much need. To employ this population, and to limit their imports of manufactured goods, might seem, in their case, peculiarly advantageous; but it must be borne in mind, that every extra shilling paid for Irish manufactures might, with equal advantage to the purchasers, be applied to raise a fund for the employment and support of their idle countrymen. The plan of a self-imposed protective duty, also, is an extremely clumsy and treacherous mode of encouraging Irish manufactures. It is a plan that cannot be of long duration. It may induce the manufacturers to enlarge their spheres of operation beyond the limits on which their trade is soundly based, and being thus misled by a dazzling appearance of improvement they may be ultimately ruined, when the now prevailing excitement, which has its foundation on political feeling and animosity to English interests, has subsided.

The existing combination in Ireland against English manufactures, with the professed object of encouraging the manufactures of that country, is the more to be condemned because it proceeds from a party which has been the principal means of obstructing the measures which would have rendered such attempts to force the products of Irish industry on the people unnecessary.

The low price of labor in Ireland, and the many facilities it presents in other respects for various branches of manufacture, would have long since induced British capitalists to establish factories in that country, had it not been for the continually disturbed state of the population, excited by political agitators, which renders it hazardous to invest capital where life and property are so unsafe. Could we but see tranquillity established, order maintained, and civilisation extended, there would then be no necessity for a vamped-up and hollow protection of Irish manufactures; they would speedily be able to rival in quality and price those of England. As it is, the present attempt—though it has met with approbation from quarters where we could least have expected in England—is, we feel persuaded, but a deceptive phantasm; and that, even were a protecting duty established by law, it would not be permanently beneficial to the country.

The verdict of the coroner's jury at Harrow, on the bodies of the men killed by the collision on the London and Birmingham railway, is the most important decision respecting railway accidents yet pronounced at such preliminary investigations. The verdict of *wilful murder* and of *felo-de-se*, though it will be inoperative in the present case, owing to the death of the delinquent, will, nevertheless, have an important cautionary effect on other engine-drivers. The reckless conduct of the engineer, who caused the collision, as detailed in the evidence of the fireman of his engine, almost surpasses belief.

The observations which the jury appended to their verdict are of equal importance to the verdict itself. It will be seen they recommend the adoption of the plan we were the first to suggest, of placing the engineer and the whole train under the charge of a "Captain"—a man of respectability and intelligence, fit to be intrusted with so important a duty.

In the propriety of the heavy deodand which the jury imposed on the engine, we cannot concur. It is well known that the general management of the London and Birmingham railway has been less open to censure than that of any other line; and in the case in question there was no important omission of any precautionary measure. The fault of the directors consisted in continuing to employ a man who had shown himself, in previous instances, reckless of consequences; but it does not clearly appear that these instances were made known to the directors to their full extent.

NEW INVENTIONS.

NEW AGRICULTURAL IMPLEMENT.

A very ingenious contrivance has been invented by Mr. Robert Muir, coachman to A. Hamilton, Esq., of Carcluie, which, by a slight alteration, can be applied either to the sowing of beans or the raising of potatoes. The apparatus may be affixed to any plough; but in the raising of potatoes, the double-reisted plough is considered best adapted for the purpose. In the sowing of beans, a couple of boxes or hoppers are attached to the plough, and put in motion by two wheels in front. The beans are deposited in the drills, and covered in on each side by the sock. The potato raisers are of a circular shape, and supplied with a number of long teeth. They are placed at the ends of the reists, and, propelled by straps from the wheels in front, come in contact with the mould, raised by the ploughshare, and throw the potatoes out behind.

Although the use of wheels would be somewhat novel in the Scottish system of ploughing, they are very generally used in some places in England.—*Ayr Observer.*

NEW KIND OF RAILROAD.

Letters from Munich, of the 14th of November, contain the following notice of a new kind of railway:—"The Chevalier Wiebeking, a privy councillor, and one of our most experienced engineers, has this day announced to the mathematical and natural philosophy class of the Royal Academy of Sciences, the plans of his invention for the construction of railroads on a new principle. He states the different parts of this invention, and the great advantages which result from it, in comparison with the railroads that have hitherto been established. These advantages he enumerates as follows:—1st. This plan is not attended with half the expense of the other railroads —2d. It may be completed in less time, and may be carried over marshes and downs without embankments.—3d. No tunnels are required, nor any excavations on high grounds.—4th. It occasions no lateral traction of the wheels of the locomotives, nor of the carriages. There is besides no danger of the wheels gliding off the rails.—5th. This construction can be adopted over the tracks and roads which exist at present; thus the expense of purchasing land will be saved. In short, these rails may be used for locomotives, as well as for every other description of wheeled carriage, provided that the carriages have the same width between the wheels. A single horse on a railroad of this description will be able to draw from 60 to 150 quintals. Carriers and farmers may make use of it without inconvenience."

[We wish foreign inventors would give more precise accounts of the method by which they propose to produce the wonderful effects we so often hear they have succeeded in accomplishing. We are quite in the dark as to the Chevalier's *modus operandi* in the plan above noticed.]

INVENTIONS IN EMBRYO.

A correspondent at Bury, Lancashire, communicates the following:—"There is now constructing in Bury, Lancashire, by a friend of mine, a rotative steam-engine, on a new principle, which, if it answers the expectations of the inventor, will be speedily patented. There is also constructing a few miles from here, by way of experiment, a steam life-boat; I have not seen it, but the inventor has written to me and wishes me to go to see it.—When at liberty to do so I may send you the earliest intelligence on both subjects.

A SHOE-WARMER.

Mr. Jones, the inventor of numerous ingenious contrivances for adding to domestic comfort, has just produced a seasonable apparatus for warming and drying shoes without injury to the leather, as is often now the case, from placing the shoes too near the fire. This invention consists of hollow tin lasts, made to the size required, with holes at the top for the purpose of filling them with hot water; the holes being then closed with a screw or cork. The lasts thus heated are placed inside the boots or shoes, and communicate the requisite degree of heat, without danger from falling cinders or from too great heat. To this contrivance the inventor has given a very learned unpronounceable name; but we prefer giving its plain English signification of shoe-warmer.

IMPORTANT IMPROVEMENT IN REFLECTING TELESCOPES.

The *Dublin Evening Mail* gives, in its report of the proceedings of the Royal Irish Academy, the following account of an important improvement effected by Lord Oxmantown, in the manufacture of the reflectors of telescopes.

Unusual interest was excited at the meeting of the Royal Irish Academy, on Monday evening last, by a communication made to the Academy by Dr. Robinson, of Armagh, relative to an extraordinay triumph just achieved in perhaps the most sublime walk of human science, by our accomplished, and now even illustrious, countryman, Lord Oxmantown.

Dr. Robinson stated that he had just returned with Sir James South, Astronomer Royal at Greenwich, from Parsonstown, whither they had been attracted by the fame of Lord Oxmantown's recent improvements in the construction of the telescope, improvements which promise to extend, and have, in fact, already extended, the bounds of astronomical science beyond all the traces of observation hitherto left by former explorators of the heavens.

It appears that in the telescope, we must not only magnify the object, but also bring in additional light to compensate for the faintness of outline caused by the spreading of the image over so much larger space. In the reflecting teloscope, this supply of additional light is obtained by means of a metal mirror, having such a curvature of its polished surface as converges all the light that falls on it exactly at the point where the image is taken up by the magnifying lens to be presented in its enlarged state to the eye; the quantity of light, so obtained, depends on the extent and perfection of the polished surface.

To procure the largest possible mirrors or *specula* is therefore a primary object with the practical astronomer, as without their illuminating aid the higher magnifying lenses cannot be employed. But in the production of these delicate and expensive articles, there are two difficulties to be got over, which have hitherto been deemed to be all but insuperable, in all cases where the dimensions of the mirror exceed a very moderate limit. These difficulties consist, first, in the intractability of the peculiar metal used in the manufactnre of the mirrors; and, secondly, in the excessive nicety required in bringing that intractable and brittle material to a polished and duly curved surface. The material which alone is found to take the necessary high degree of polish, and which is known as *speculum metal*, is composed of two parts of copper to one of tin—an alloy which is found to produce a substance much harder than glass; but, alas! proportionately more brittle. The least change of temperatnre during the process of casting, or the most trifling scratch during that of polishing, causes the largest masses of this expensive material to fly in a thousand pieces. Hence the extreme difficulty, hitherto, of procuring specula of more than from 8 to 12 inches diameter; and even in these the susceptibility of perfect polish has been generally much lessened by false proportions of the alloy resorted to by the maker for the purpose of giving toughness and tractability to the material. For it is a remarkable fact that no other alloy than that formed by the exact mixture abovementioned will take a polish at all equal to that of the true speculum metal. The great object glass of Sir Wm. Horschell's famous telescope was no more than a dull bell metal. That distinguished astronomer never was able to make any thing out of the trne speculum metal. In fact, so great were the difficulties of casting the masses requisite for mirrors of even moderate dimensions, that it was with the greatest reluctance the London opticians would undertake orders for specula of more than nine inches in diameter. Joined to this intractability in casting, was the other difficulty of giving the true curvatnre in polishing. The figure of the curve required is very peculiar, being neither truly spherical nor parabolic. No formula could be given for it, and it had to be produced by actual manipulation of the most laborious and tedious nature.

The larger mirrors particularly were very frequently distorted, and the effect of the extended polished surface was lost by the waste of light consequent on the rays converging in different *foci*.

Lord Oxmantown has succeeded by a peculiar method of moulding, in casting object *glasses** of true speculum metal, of 3 *feet in diameter, and of a weight exceeding* 17 *cwt.*, and there remains no doubt he possesses the power, and will very soon have put it in practice, of casting solid *specula of six feet in diameter, and of the weight of* 4 *tons*. These great masses of metal which in the hands of all other makers of object glasses, would have been as intractable as so much unannealed flint glass, Lord Oxmantown has further succeeded in bringing to the highest degree of polish, and the utmost perfection of curvature, by means of machinery. The process is conducted under water, by which means those variations of temperature, so fatal to the finest object glasses hitherto, are effectually guarded against. To convince Dr. Robinson of the efficacy of this machinery Lord Oxmantown took the three foot speculum out of its telescope, destroyed its polished surface, and placed it under the mechanical polisher. In six hours it was taken out with a perfect new surface as bright as the original. We know not how many months or even years might have been required to effect this restoration under the old system of hand polishing.

But even before achieving these extraordinary triumphs on the solid substance, Lord Oxmantown had constructed a six-foot reflector by covering a curved surface of brass with squares of the true speculum metal, which gave an immense quantity of light, though subject to some irregularities, arising from the number of joinings necessary in such a mosaic work. Of the performance of Lord Oxmantown's great telescope mounted with this reflector, as directed towards a certain class of objects, Dr. Robinson spoke in the highest terms of admiration; but in reference to the smaller and more perfect instrument furnished with the solid 3-foot speculum, the language of the Armagh astronomer assumed a tone of enthusiasm and even of sublimity. By means of this, the finest instrument of the kind ever in existence, Dr. Robinson and Sir James South, in the intervals of a rather unfavourable night, saw several new stars, and corrected numerous errors of other observers. For example, the Georgium Sidus, supposed to possess a ring similar to that of Saturn, was found not to have any such appendage; and those nebulæ, hitherto regarded, from their apparently circular outline, as "coalescing systems," appeared, when tested by the 3-foot speculum, to be very far indeed from presenting a globular appearance; numerous offshoots and appendages, invisible by other instruments, appearing in all directions radiating from their edges.

* *Object reflectors* would be a more correct expression, but as the word *glass* is used throughout the account given by the *Dublin Mail* we retain it.

EMPLOYMENT OF CHILDREN IN COAL MINES.

The children go down with the men, and remain in the pit between eleven and twelve hours. To ascertain the nature of the employment of these young children, I embraced an opportunity of visiting a pit in the neighbourhood of Newcastle. Descending a shaft 600 feet deep, I went some distance along a subterranoons road, which, I was told, was three miles in length (the overman going before me with a Davy lamp in one hand, and, as if to neutraliso the precantion, a lighted candle in the other). To the right and left of one of these roads, or "ways," are low galleries, called "workings," in which the "hewers" are employed, in a state of almost perfect nudity (on account of the great heat), digging out the coal. To these galleries there are traps or doors, which are kept shut, to guard against the ingress or egress of inflammable air, and to prevent counter currents disturbing the ventilation. The use of a child of six years of age is to open and shut one of these doors when the loaded corves or coal trucks pass or repass. For this object the child is trained to sit by itself in a dark gallery for the number of hours I have described. The older boys drive horses, and load the corves; but the little children are always trap-keepers. When first taken down, they have a candle given them; but, gradually getting accustomed to the gloom of the place, they learn to do without, and sit, therefore, literally in the dark, the whole time of their confinement. It is

impossible to imagine a more monotonous and dismal occupation for a child; and yet I was told the children were not unhappy, although it was generally admitted "they did fret a great deal at first." The truth is, that, by blunting the sensibilities, and deadening the faculties, the mind may be rendered callous to a lot which would otherwise be too bitter for human endurance. Poverty of the parents is not the cause of this immolation of infancy. The pitmen of the north of England collieries are a better paid class of operatives than any body of working men equally numerous. I found their average earnings to be 24s. per week; and when a colliery is not limited in the quantity of coal allowed to be raised (which by agreement among the coalowners is sometimes done to keep up prices), a pitman often earns 30s., and even 40s., in a week. Besides this amount of money wages, he is allowed a cottage rent-free, or at a mere nominal rent of sixpence a fortnight, the cottage frequently containing four good rooms. He has also a bit of garden, rent-free, sufficient for the growth of his vegetables; and, moreover, another important advantage, for which he may well be envied by the London operatives—as much coal as he wishes to burn the year round, free of charge. All I have observed, however, only strengthens my conviction, that high wages and corresponding benefits are thrown away upon those who have received no moral culture, and are incapable of self-guidance.—*Mr. Hickson's Report.*

ON THE ECONOMY OF RAISING WATER FROM COAL MINES ON THE CORNISH PRINCIPLE.

At the annual meeting of the members of the Manchester Geological Society, Mr. Fairbairn read a communication "On the Economy of raising Water from Coal Mines on the Cornish Principle." In introducing his paper to the meeting, Mr. Fairbairn, after explaining the sections of the engine and pumps made by him for some Belgian coal mines, said, that the improvements introduced of late years into the Cornish engines were of so important a nature as to be highly worthy the attention of the miners of this district. They had not, till very lately, the slightest conception of the great saving effected by the performance of the Cornish engines, which was so great that the pressure of steam in the cylinder, which would amount to 7,500 lbs. per square inch, would raise nearly double the amount of any in the neighborhood, chiefly from the advantages of the expansive principle adopted in the Cornish engine. Mr. Fairbairn then proceeded with his paper, of which the following is an abstract:—

"From the time of Savery and Newcomen, in 1707, to that of Beighton, in 1717, the state of the steam-engine remained stationary, till 1769, when Smeaton introduced considerable improvements upon atmospheric engines, the average duty from fifteen of which amounted to 5,590,000 lbs., lifted one foot high by a bushel of coal. These improvements continued; and the duty, in 1772, was raised to 9,450,000lbs.

"Mr. Watt's improvements commenced in 1776, when the average duty was declared at 21,600,000—more than double that of Smeaton's; and, during the years 1778-9, it was still further increased.

"In 1779, and from that to 1788, Mr. Watt introduced the improvement of working steam expansively, which raised the duty to 26,600,000. From 1788 to 1812, few, if any improvements, were made in the Cornish engines; and, provided we except the plunger pole, which was introduced about this time, I question whether the Cornish engineers and miners did not retrograde rather than advance during a period of twenty-four years.

"In 1814 considerable advances were made, which raised the duty to 32,000,000 lbs. During that year, Wolf's engine, with two cylinders, was introduced, which again advanced the duty to 54,000,000 lbs.

"Mr. Woolf, above all others, did most for the Cornish engines, by showing the advantages peculiar to high pressure steam, and prepared for subsequent improvements, which led to the present effective system of expansive working.

"During a period of six years, from 1815 to 1820, Woolf's double cylinder engine maintained its superiority, and gave a higher duty than any other.

"Woolf's engine, in process of time, gave way to others of a better construction. They were introduced by Captain Samuel Grose, whose experiments upon the generation and preservation of heat led to great improvements, and ultimately established a new era in the history of the Cornish engine.

"In 1826, Captain Groso's engine, at Wheal Hope, attained a duty of 62,000,000 lbs.; and, in July of the following year, one of Mr. Woolf's single cylinder engines performed the unprecedented duty of 67 millions.

"From this time Captain Grose's improvements were appreciated, and generally introduced; they led to a still greater advance in the duty, which this year reached as high as 87 million lbs.

"Messrs. Lean and Brothers report the duty of a few of the Cornish engines at this time as follow:—

	Millions lbs.
Wheal Towan Engine.....	87·0
Wheal Hope.....	74·8
Consols	67·6
Binner Downs	63·5
Consols	61·7
Consols	61·3
Wheal Vor	61·1
Wheal Towan, (Druce's)	59·4
Consols	58·4
Poldice	57·8
Wheal Vor	51·9

"These give a mean duty of sixty-four millions of pounds.

"Nothing remarkable took place till 1834, when the duty was raised to 90 millions lbs. Since then, it has continued to increase in the ratio of 90, 100, and 110 millions: and during the last meeting of the British Association at Glasgow, Mr. Taylor reported the present duty at the unequalled performance of 123,300,593.

"Having briefly stated the progressive improvements that have taken place in the Cornish system of pumping, I would now direct the attention of the society to the important results which these improvements have produced.

"The quantity of coals consumed by all the engines working in the mines in Cornwall, in the year 1835, was, according to Messrs. Lean and Brothers, 1,669,421 bushels. Now, if we compare this with the number of bushels which would have been consumed to produce the same power in 1814, we should have, for the consumption at that period, 4,049,878 bushels, making a saving of 99,186 tons; by which, taken at 17s. per ton (the price of coal in Cornwall) we have the enormous saving of £84,308."

MR. WILLIAMS'S LECTURES ON COMBUSTION.

(Continued from our last.)

Mr. Williams gave his third lectures to a numerous auditory on Friday evening, at the Scientific Institution, St. Anne-street, Liverpool, exhibiting additional diagrams explanatory of the several conditions on which the combustion of coal is effected.

Mr. Williams commenced by observing, that he then came before his hearers with more confidence from having received the concurrence of some of the most unquestionable authorities of the present day on the views he had taken on the subject, namely, Dr. Faraday, Dr. Ure, and Professor Brande. Having understood that it had been stated, that, "as he (Mr. Williams) was not a professional chemist, his authority on a chemical subject was not entitled to any consideration, and that, in fact, he was wrong in his chemistry," he felt naturally desirous of standing right in their opinion, and, addressing a letter to each of these gentlemen, requested, professionally, their opinion on the views he had taken of combustion. Mr. Williams stated the favorable opinions which had been verbally expressed by Dr. Faraday and Dr. Ure, and read the following letter from Professor Brande, of the Royal Institution, London:

Royal Mint, London, 26th November, 1840.

My Dear Sir,—I am convinced, that you are not only practically, but theoretically and scientifically right in regard to the general views put forth in your essay on the combustion of coal and the prevention of smoke. I have long advocated the principles which you have adopted, and have annually illustrated them in my lectures in the Royal Institution; but it unfortunately so happens, that, when scientific men urge new views, or suggest the practical adoption of rational theories, they are neglected, because it is presumed they are merely founded on unsubstantial hypotheses; and, on the other hand, when practical men attempt to found improvement on scientific principles, they are sneered at as dabblers in science; and, so, both become disheartened and disgusted, and the only people who are temporarily successful are quacks, who, pretending to what is called originality, and, neither referring to practice or science, steal from both; but, deficient in all knowledge of their own, ultimately mislead their followers; and, like the alchemists of old, not unfrequently deceive themselves.

Under these circumstances, it is really refreshing to find a person of your experience willing and able to blend practice with science and theory; and I have no hesitation in saying, that the views promulgated in your essay are substantially founded upon just and scientific principles.

When the unburned hydrocarbons, which are produced during what is commonly called the combustion, but which, in reality, is principally the destructive distillation of coal, in our ordinary steam-boiler furnaces, gradually mix with air, they assume the form of what is called uninflammable smoke; but if they be examined immediately after they leave the fuel, and before they have blended with excess of cold air in the chimney shaft, they are found to be highly inflammable and rich in carbon. At this point it is that you judiciously admit the jets of air; and, in so doing, every jet which enters the inflammable atmosphere within the flues becomes, as it were, the centre of combustion, and tends to increase the heat by burning and destroying that hydrocarbon which otherwise would go on to produce worse than useless smoke.

When air is admitted in front of the furnace, or through or over the fuel, it obviously never can effect those useful purposes which are at once obtained by admitting it in due proportion to the intensely-heated inflammable vapours and gases; or, in other words, to the products of the distillation of coal, at such temperature that they may take fire in its contact. In this way, each jet of air which you admit becomes, as it were, the source or centre of a separate flame; and the effect is exactly that of so many jets of inflammable or coal gas ignited in the air; only, in your furnace, you invert this ordinary state of things, and use a jet of air thrown into an atmosphere of inflammable gas; thus making an experiment upon a large and practical, which I have often made on a small and theoretical, scale, in illustration of the inaccuracy of the common terms of "combustible" and "supporter of combustion," as ordinarily applied.

I fill a bladder with coal gas, and attach to it a jet, by which I burn a flame of that gas in an atmosphere of, or a bell glass filled with oxygen; of course, the gas burns brilliantly, and we call the gas the combustible, and the oxygen the supporter of combustion. If I now invert this common order of things, and fill the bladder with oxygen, and the bell glass with coal gas, I find that the jet of oxygen may be inflamed in the atmosphere of coal gas with exactly the same general phenomena as when the jet of coal gas is inflamed in the atmosphere of oxygen. This is precisely your process. You admit a number of jets of air into a heated inflammable atmosphere, and so attain its combustion in such a way as to produce a great increase of heat; and, as a necessary consequence, destroy the smoke. You, in fact, convert what is commonly called smoke into fuel, at the time when, and the place where, this combustion can be most effectively brought about.

I have now given you my candid opinion respecting your views of the phenomena of combustion and their application to the object proposed in your essay; there are some of the minor points of which I cannot speak without further consideration; but these do not in any way affect the main object of the inquiry in its practical bearings.—I am always, my dear sir, sincerely yours.

WILLIAM THOMAS BRANDE.

To Charles W. Williams, Esq.
Dublin Steam Company, Liverpool.

With such authority in favour of the chemical relations of combustion which he had endeavoured to explain, Mr. Williams called on his hearers to receive, not as his own opinions, but as those of the able professors he had alluded to, such chemical facts as he should bring before them. He then proceeded to explain the great practical errors into which so many patentees had fallen in miscalculating the temperature required for the ignition of the gases in the furnace. These errors appeared to have originated in a neglect of the conditions under which Sir Humphrey Davy had effected the combustion of carburetted hydrogen, and which he had described as requiring a very high temperature,

As, however, the operation was performed on gas, in the laboratory and at the temperature of the atmosphere, it bore no analogy, as to temperature, to the gas we encountered in the furnace, where it had already received a very high degree of heat. Mr. Williams then explained the difference between heating the gas and heating the air, previously to their combination, showing that we take great pains to invent modes of effecting the latter, whereas heating the gas was the point which required more attention, and which we overlooked.

In illustration of the erroneous view of the subject adopted by so many, he quoted the patent of Mr. Watt, in 1785, and those of several of his followers, who had considered that the combustion of the gases was to be effected, more or less, by bringing them into connection with a body of highly ignited incandescent fuel, and without any regard to the question of air or the quantity required.

With respect to the *place* where the air should be admitted into the furnace, Dr. Lardner, in his last edition of his work on the Steam Engine, had alluded to his (Mr. Williams's) mode of introducing air to the gas, but described it as the direct reverse of what he had insisted on as the absolute essential, namely, the bringing it from a source independent of the ash-pit.

Mr. Williams also alluded to the charge which had been made by Mr. Robert Armstrong, of Manchester, in consequence of his introducing the air behind the bridge of the furnace, and which, Mr. Armstrong asserted, could only be the result of the greatest ignorance on the subject. On this head, Mr. Williams re-asserted, that the air should be introduced behind the bridge, and nowhere else, and for these reasons, that the gases were nowhere else to be met with, and that nowhere else could time be obtained for effecting their duo admixture or diffusion.

On this head, however, Mr. Williams stated, that the question had satisfactorily been answered in the letter from the high and unquestionable authority of Mr. Brande, which he had just read.

After forcibly illustrating these views, and showing their connection with the practice in the furnaces, Mr. Williams exhibited one of his air-diffusion tubes, made of fire clay, and which had been found, in the furnace, to produce the effect described by Professor Brande; a proof of which, Mr. Williams daily exhibits at the premises of the Dublin Steam Company, at the Clarence Dock.

Mr. Williams announced, that he would conclude his course of lectures on Friday (yesterday).

ORIGINAL REPORTS OF SCIENTIFIC MEETINGS.

(Contributed expressly to the Inventors' Advocate.)

MEETINGS OF THE SCIENTIFIC BODIES OF LONDON,—FOR THE WEEK COMMENCING DECEMBER 7, 1840.

Monday.	Entomological Society	8	P.M.
	British Architects	8	P.M.
	Medical Society	8	P.M.
Tuesday.	Medico-Chirurgical Society	8	P.M.
	Zoological Society	8½	P.M.
	Royal Botanic Society	8	P.M.
	Meteorological Society	8	P.M.
Wednesday.	Society of Arts	7½	P.M.
	Graphic Society	8	P.M.
	Medico-Botanical Society	8	P.M.
Thursday.	Royal Society	8½	P.M.
	Society of Antiquaries	8	P.M.
	Royal Society of Literature	4	P.M.
Friday.	Astronomical Society	8	P.M.
Saturday.	Westminster Medical Society	8	P.M.
	Mathematical Society	8	P.M.

NUMISMATIC SOCIETY.

Nov. 19. J. Dodsley Caff, Esq., in the Chair.

The secretary read a letter from the late president, Mr. Hawkins, announcing his resignation, as well as that of Mr. Birch's of the office of secretary, in consequence of the trustees of the British Museum refusing their permission for the latter to hold that office.

Presents were announced from M. L. Chev. Brondstedt, M. Le Clerk on the coins of Gaul, Spain, and Britain, before the arrival of the Romans.

A paper was read from the Rev. F. Dimock, on the Saxon pennies restored into the royal Series, bearing the name of Ethelwald, Archbishop of York, and Egbert, King of Northumberland, with an additional note on the same from Mr. Hawkins, stating them to be correct, and noticing the previous discovery of the same fact by Mr. Lindsay. A letter was read from Mr. Lindsay announcing a discovery of almost a hundred pennies of Edward I. and II., found at Dungarvon, near Waterford; and his discovery of an unedited coin of Eadred, with a new moneyer's name on the reverse, which Mr. Lindsay considers a unique coin.

A communication was then read from Mr. H. P. Borrel, of Smyrna, announcing various unedited Greek coins, among others one of great interest of Eurydicea.

SOCIETY OF ARTS.

Nov. 25. Dr. Roget, V.P., in the Chair.

The secretary read the report of the committee of mechanics on various inventions, one of which elicited a discussion on the respective properties of glass and paper shades for table lamps of different kinds. Among the subjects reported on were;—proposed improvements in the ventilation of factories and workshops;—reduction of friction in steam-engine gearing;—a fire-escape;—an apparatus for raising sunken vessels, &c. Several presents were announced.

On the list of candidates for election as members were the names of several native Indians, who are desirous of co-operating with the society in promoting the encouragement which it holds out to the trade of the Colonies and of the British possessions in India.

MEDICO-BOTANICAL SOCIETY.

Nov. 25. Earl Stanhope, President, in the Chair.

The minutes of the preceding meeting having been read and confirmed, the Secretary read a paper from Dr. Arnold, communicated by Dr. Sigmond, F.L.S, on the "Properties of the *Datura fastuosa*," which, in the figurative language of botany, is a Bella donna superiosa. The author's attention was first drawn to the plant, which flourished in his garden at Jamaica, under very singular circumstances, before he inspected its botanical character. His child had been playing in the garden with her sister, by inflating the petals with her breath, and then, by striking them one by one with some force against the back of the hand, the cheek, or the forehead, caused the petal to burst and produce a noise like the explosion of a small percussion cap. In this innocent way they had employed themselves some time, when the eldest child suddenly exclaimed that she felt a pain in the right eye, and ran into the house, to her mother, in fear and alarm, holding up both hands to the affected eye, to exclude the light, which she could not bear. Upon examination the pupil of the eye was extremely dilated, and the intolerance of light was great. The pupil remained dilated for twenty-eight hours.

The author could in no way conjecture the cause of these symptoms, until led by consideration to examine all the flowers with which the children had amused themselves, and more especially the flower which they had inflated, that being the only one which had come in contact with their lips. The plant, upon examination, corresponded with the description of *Datura fastuosa*. Being aware that the Henbane (*Hyoscyamus*) and others produced like effects, he made some experiments, which were fully conclusive, in his mind, that some of the juice must have entered the eye of his child, by striking the flower on the forehead, just above the eye. It was afterwards tested, by Dr. Bancroft and Dr. Parnel, in the public hospital, with very satisfactory results. It is held in great estimation by the French inhabitants of the city, for other medicinal purposes, and appears to have been introduced into Kingston shortly after the revolution in St. Domingo, when the natives sought shelter under the care of the English. A Baron cultivated the plant to some extent, and sold it as a cure for *Maladie du tête*, at the price of a penny current *per leaf*; and owing to its being an effectual remedy, it was much sought after. It was also advised in neuralgic affections, applying the fresh-gathered leaves, moistened, to the forehead and temples, and renewing them every three or four hours. The leaves are, however, applied in various ways, for various disorders, applied externally. For gout and rheumatism, they are placed in camphorated spirits, and allowed to remain for about one hour previous to being applied in the form of poultice, always producing sleep and easing the pain. Instances of its beneficial effects in other diseases, as strangury, spasmodic asthma (when smoked), &c., were recorded. An active principle, *Daturine*, has been obtained from the leaves, by Mr. Churchill, a practical chemist, at Kingston, Jamaica.

BOTANICAL SOCIETY OF LONDON.

Nov. 30. J. E. Gray, Esq., F.R.S., President, in the Chair.

(Fourth Anniversary Meeting.)

The day fixed upon for the anniversary meeting of this society is the 29th of November, (being the anniversary of the birth of the very illustrious British Botanist, JOHN RAY), but owing to the 29th falling on the Sunday, the meeting was held, according to the laws, on the following day.

The secretary read the report of the council; in which it was stated that the society is in a very prosperous position, a greater number of members having been elected during the past session than in the two previous years, the number amounting to 23: the society now consists of 128 members. The accounts having been audited were read, from which it appeared that the balance in the hands of the treasurer was £22.

The report of the Curator with respect to the British and Foreign Collections of Plants received during the year, was as follows:—The British collection comprises 1,155 species, including 20,022 specimens in progress of arrangement, from which the society's collection will be enriched, and the remainder will be distributed, in the month of February next, to those contributing members desirous of completing their own collections, in proportion to their donations, both as to number and rarity of the specimens forwarded; those who have contributed the largest number receiving in return the rarer species. Fifty-six members have furnished specimens of British plants. The Foreign collection amounts to between 13,000 and 14,000 specimens, including a valuable series of Brazilian plants, presented by Dr. C. F. P. Von Martius, and collected by him during his travels in Brazil. A series of South African specimens, collected by Dr. Ferdinand Krauss in Natal, and a large collection of plants from the United States, presented by Dr. Gavin Watson, from neither of which places had specimens been hitherto presented. The report was unanimously adopted.

The ballot for the officers then took place, when the chairman was re-elected *President*, and nominated J. G. Children, Esq., F.R.S., &c. and Hewett Cottrell Watson, Esq., F. L. S., the *Vice-Presidents*. The society then elected J. Reynolds, Esq., *Treasurer*—Daniel Cooper, Esq., *Curator*,—G.E.Dennes, Esq., F. L. S., *Secretary*,—and Thomas Sansom, Esq., and S. P. Woodward, Esq., *Assistant-Curators*. Mr. R. H. Schomburgh was present, and promised to forward to the society a specimen, in spirits, of the flower of the *Victoria regia*, as soon as he arrived in Guiana.

The members supped together at the Crown and Anchor, Strand. Among other toasts given from the chair, that of the Botanical Society of Edinburgh, was cordially received.

[We beg to inform our readers, members of the above, that they will always find in our Journal the fullest particulars of the proceedings of this society.]

LINNÆAN SOCIETY.

Dec. 1. *E. Foster, Esq., F.R.S., V.P., in the Chair.*

Mr. Cumming, gardener to Lord Braybrooke, exhibited many interesting specimens of rare British plants, collected in the neighbourhood of Saffron Walden, Essex, including *Fritillaria Meleagris, Lagurus Orutus*, &c., &c. On the table among the donations was Part I. of Mr. Gould's splendid work on the Birds of Australia; and Part I. of Harris's Wild Animals of Africa—two first-class works on zoology. The Marquis of Northampton, President of the Royal Society, was proposed a fellow, and Mr. G. Gordon an associate. Mr. Gould exhibited a new lizard, covered with spines, and singularly variegated, collected by him in Australia. A letter was read from Mr. Clarke, of Saffron Walden, Essex, on the occurrence of *Crocus sativus*—by many considered to be a native species. It is well known that this town has received its name from the circumstance of the abundance of saffron which was procured from its neighborhood—the saffron being the central portions (pistil) of the flower of the above-named *Crocus*. But little, however, of this plant is cultivated here at present, Mr. Barron being the only grower. Specimens of the plant have recently made their appearance on land that was overturned for the purpose of making the foundation for the museum of that place; but notwithstanding this, Mr. Clarke is of opinion that the plant is not indigenous to that neighbourhood, as usually recorded in botanical works.

A communication was read from Dr. Lancaster, F.L.S., "On a White Incrustation on Stones, from the bed of the river Annan, Dumfries-shire, produced by the *Synedia Ulna*, of Ehrenberg." During a short residence at this locality last summer, Dr. L.'s attention was attracted by the white appearance of gravel and stones on the side of the river, having the aspect of being white-washed. On examining them with a pocket lens, he observed numerous filaments of *Confervæ*, and likewise small shining particles, which, on examination, proved to be acicular bodies, of about the 1-100th of an inch long, and 1-1000th of an inch broad, arrayed in a stellate manner. On referring to Dr. Greville's work, they appeared somewhat like his genus *Exilaria*; but on consulting the splendid work of Ehrenberg, he found them under the head of *Polygastric Animalcules*, and of the family *Baccillaria* (possessing a short pedicel). The bodies were not, however, striated, but approached nearest to Ehrenberg's *Synedia Ulna*. The discovery of this fact, connected with the white appearance of stones at the river side, is new, especially as it is owing to the siliceous cases of an animalcule already described.

A paper was read by Professor Don on the "Anatomy of *Fucus Vesiculosus*." This is the common sea-weed, or bladder wrack of our coasts, in which Mr. Don has discovered a new structure, at least not hitherto noticed in this plant. In the bladders, or *air-cells*, there exists, issuing from the walls of the cells, numerous filaments, having a jointed structure, not hitherto observed. A variety of other minute particulars were noticed by the author, in connection with the microscopic appearance of the cells of the plant.

Mr. J. O. Westwood's paper on the genus *Derbe* of Fabricius was read, accompanied with plates. This genus belongs to the Homopterous order. The meeting then adjourned.

SCIENTIFIC MEMORANDA, AND NOTES ON ART.

Mechanical Curiosity.—The longest pendulum on record.—On lately visiting the village of Ramsbottom, near Bury, in Lancashire, we inspected the church clock, in the tower of St. Andrew's Church, a handsome stone edifice, erected a few years ago at that place, at their own expense, by the Messrs. Grants, whose extensive works are in the immediate vicinity, and by the same gentlemen liberally endowed for the use of the inhabitants. The room itself in which the working machinery of the clock is placed, is lofty and spacious. The works occupy one side of the room, and stand on a large ornamental cast iron plate or framing, rising about eight inches above the floor. Four large cast iron columns, reeded and polished, support the works, and six pillars of the same metal, also reeded and polished, support the barrels round which the ropes are coiled to which the weights are attached. The barrels (weighing in their finished state three hundred weight and a half) are of polished brass, and their centres rest on peculiarly formed brass steps, so constructed, that, when once properly supplied with oil, no more will be needed for several years. The striking part goes twelve, and the hour part twenty-four days, with one winding up. The four exterior sides of the tower are each furnished with a dial plate, besides which there are two other plates, one in the clock room itself, made of polished brass, and another in front of the gallery, within the church, making the whole number of dial plates six. The motion is transmitted to the machinery immediately connected with the pointers, by a series of steel rods, placed, in many instances, at a considerable angle, and in some almost at right angles, with each other, without the aid of a single wheel throughout their whole extent; well formed and nicely adjusted universal joints supplying the place of wheels. The hands on all the dials are put in motion by a friction cone, ingeniously fitted in the interior of the hour wheel; so that if it should happen that any of them should be stopped by frost, snow, accident to, or derangement of, any of the rods, more immediately connected with them, the others would continue true indicators of time; or should the whole of the hands on the six dials be stopped, the works would go on with uninterrupted regularity until the weights were run down. Connected with the whole of the works, there are fifty-two wheels, all finished in the best style of workmanship, and of polished brass; but the hour and the striking departments have only two wheels and two pinions each, which in their finished state we were informed weigh one hundred and four pounds each. All the rods (the pendulum rod excepted) are of cast steel, case hardened, and well polished.* The escapement is entirely on the dead beat principle without the least perceptible recoil. The pendulum is thirty-six feet 6-½ inches in length (we believe the longest on record) and vibrates eighteen times per minute. It is formed of well-seasoned timber, covered with leaf gold and several coats of paint and varnish, so that no atmospheric changes may sensibly affect it. It is suspended by double universal joints, with two broad intermediate springs. An index is attached to the rod to ascertain the arc of vibration, in the different temperatures of the atmosphere, the changes in which are indicated by a thermometer placed in the clock room. In the room is a hollow square ornamented column, through which heated air passes from a stove placed in the basement story of the tower, by which the temperature is kept at about sixty degrees. The ball weighs one hundred and forty-eight pounds, and vibrates two feet at its centre. The works are kept in regular motion during the operation of winding up by a circular rack, and what we believe is something new in clock works, the pallette and arms are all set by screws and joints, so that any, or every part of them, can be adjusted at any time with the utmost ease, and to the greatest nicety. The rods also are so fitted up that no ordinary elongation or contraction they may undergo by the varying temperature of the atmosphere, or the settling of the tower, will ever affect them so as to disturb the regular working of the machinery. This useful piece of mechanism was made at Messrs. Grants' works, by Mr. J. Buchanan, their chief mechanic, under the personal inspection of Mr. John Grant. From accurate tables kept for the purpose, it appears the clock kept mean time, with a variation of less than half a minute, from the 30th of December, 1838, to the 4th of April, 1839, notwithstanding the stormy boisterous weather which occurred during that period, and the exposed situation of the tower.† Another fact we should not omit, is, that so accurately were Mr. Buchanan's calculations made, that the ball of the pendulum was adjusted to within an eighth of an inch of its proper place on being first put in motion.—*From a Correspondent.*

Steam Packets versus Railway.—The proprietors of the steam-vessels have just issued a placard, announcing that the steam-boats will run in future from Newcastle and from Shields every hour regularly. This is doubtless a consequence of the North Shields Railway Company increasing their fares.—*Tyne Mercury.*

Copper Smelting in America.—A late number of the *Wisconsin Enquirer* says, that Messrs. W. Alford and P. W. Thomas, of New Baltimore, in that territory, have met with complete success in their experiments on smelting copper ore. They constructed a very simple furnace, which cost only ten dollars, in which they smelted, on the 28th of September last, 2,500 lbs. of ore, from which they obtained nearly 700lbs. of good pig copper, pronounced, by competent judges, to be superior to the South American pig copper. The time occupied in procuring from the ore the above amount of copper was only nine hours. Neither Mr. Alford nor Mr. Thomas had any experience in the business of smelting, and the result is justly deemed a matter of great consequence to that territory, which abounds in rich copper ore.

Intended Smelting Establishments.—We understand it is the intention of Geo. Stephenson, Esq., civil engineer, to establish a factory near Whitby, for the purpose of smelting iron from the iron-stone, which is found in great quantities from the almost inexhaustible mines in the neighborhood. The large percentage of iron which this valuable ore yields, joined to the great natural capabilities of the port, will, it is confidently expected, enable the proprietor to realise an adequate remuneration for his outlay.—*Leeds Intelligencer.*

Dye from the Resin of Aloes, Aloetic Acid.—This substance obtained by the action of nitric acid upon the resin of aloes, is a powder of a deep brown-red color, very bitter and astringent; it requires 900 times its weight of water to dissolve it, and only from 70 to 80 parts of alcohol. It consists of carbon 40, hydrogen 1.1, azote 12.2, oxygen 46.7. M. Bontin has ascertained that this substance is capable of communicating a great variety of shades of color to wool, but especially to silk. In mordanting silk in a solution of acetate of copper at a temperature between 158 deg. and 176 deg., washing it then in an ammoniacal fluid, passing it through a bath of *aloetic acid* at the same temperature as the mordant, and finishing by exposing it to weak vinegar, *wood* shades, (*les nuances bois*) are obtained. The *Corinthian* (*nuances Corinthe*) shades are procured by plunging the silk into a dilute solution of tartaric or citric acid at the temperature of 104 deg., and passing it through an aloetic acid bath at a heat of 122 deg. to 140 deg. The *rose* tint is obtained in a similar way; the bath being very slightly changed, and containing a small portion of alum. *Violet* shades are obtained by adding to the *aloetic* acid bath liquid ammonia and acetic acid. For silk, the bath ought to contain an excess of acid; for wool, the ammonia should predominate. *Blue* colors are formed by adding to the aloetic bath a double salt, prepared with protochloride of tin and cream of tartar. The bath becomes first violet: a solution of chloride of tin and tartaric acid is then added; a small quantity of ammonia then suffices to convert it to a blue, into which the silk is to be plunged. *Green* is produced by passing the silk, dyed yellow by carbazotic acid, into the bath, which has become blue by the preceding process.

Auriferous Pyrites.—Dr. Barham, at the late meeting of the Royal Institution of Cornwall, read a paper by S. Moyle, Esq., of Bosvigo, drawing attention to a fact but little known, or little attended to—viz., the precious metals contained in some of our pyrites, for which a market has lately been found, and from which gold and silver may, in many instances, be extracted with considerable profit. He had lately analysed a piece of auriferous pyrites (from, as he believed, a mine in the neighborhood of Wheal Gorland, in Gwennap), which gave a produce of 89 oz. per ton. But it was a singular fact, that scarcely a trace of gold could be found in pyrites recently taken from the lode, while that which had been exposed for years to the sun and air yielded several ounces per ton. It would, therefore, appear, either that the gold was destroyed by the sulphur during the assay, or that it became so incorporated with other substances as to be protected against the action of nitro-muriatic acid. These effects, it was supposed, were prevented by the decomposition of the sulphur, and liberation of the particles of gold, which took place when the pyrites were exposed to atmospheric influence.

Adipocire a substance resembling spermaceti, produced by the conversion of animal matter exposed to running water; in this way animal matter may be converted into a soft, unctuous, or waxy substance, in the space of little more than a month; but adipocire has also been produced, though not so rapidly, by the heaping together large masses of putrifying animal matter, as was discovered on the removal of a very great number of bodies from the burial ground of the Chureh des Innoeens at Paris, 1787.—*Dr. Humble's Dict. Geol. and Min.* 1840.

Cambridge Philosophical Society.—A meeting of the Philosophical Society was held on Monday evening; Dr. Hodgson, the president, being in the chair. Professor Henslow delivered a lecture to the society, on the subject of certain diseases in corn. These were illustrated by large drawings, giving representations of seven distinct diseases; four of them occasioned by fungi, viz., Uredo caries (*Bunt*), U. segetum (*smut*), U. Rubigo (*rust*), and Puccinia graminis (*mildew*). Professor H. observed that he had completely satisfied himself that Uredo rubigo and Puccinia graminis were merely different states of the same species; and that he had also obtained ample proof that Uredo rosæ and Aregma mucronata were similarly related. The other three diseases noticed and illustrated were the ergot, the ear cockle (occasioned by the Vibrio tritiei), and the abortion of the germen produced by the larva of the wheat-midge (Cecidomyia tritici). Professor H. strongly recommended the use of the sulphate of copper, as a protective against the bunt and smut, but considered that practical men had not yet obtained sufficient information of the precise conditions under which it should be applied. He particularly insisted upon the ravages of the wheat-midge being greater than was generally expected, and suggested the propriety of invariably threshing out all corn before the end of May, as the most probable means of reducing the attacks of this destructive insect within narrow limits. He expressed his opinion that one of the most important steps to be made towards securing crops from certain disorders, as well as for growing unmixed samples, was to form a distinct branch of industry for the raising of seed corn.—*Cambridge Advertiser.*

Visit of the British Association to Plymouth.—A public meeting was held at the Royal Hotel, Plymouth, on Tuesday, for the adoption of measures with reference to the intended visit of the above learned and scientific body. Among the noblemen and gentlemen present were—the Earl of Morley, Lord Eliot, M.P., H. Woolleombe, Esq., John Collier, Esq., M.P., W. Hancock, Esq., Dr. E. Moore, Lieut. Nelson, R.E., Rev. Messrs. Luney, Hore, and St. John, Rev. Mr. Odgers, and T. Gill, G. Pridham, G. Eastlake, J. E. Elworthy, G. B. Kingdon, and J. Brideaux, Esqrs., &c., &c. Mr. H. Woolleombe referred to letters which he had received from Sir T.

* The escapement is entirely of a new construction, and is the invention as well as the handy-work of Mr. Buchanan himself, for which the Society of Arts have presented him with their silver metal. To attempt any intelligible description of it, without the use of diagrams, would be useless, and would exceed our present limits, but the ingenuity and beauty of workmanship displayed, and the delicate nicety, to which any or all of its parts can readily be adjusted, reflect the greatest credit on the inventor.

† This was previous to the apparatus for keeping the room at a regular temperature being erected.

D. Acland, Bart., Sir J. T. Duckworth, Bart, and Sir C. Lemon, Bart., expressing regret at not being able to attend, but communicating, in very strong language, their cordial desire to assist, by every means in their power, in carrying out the objects of the meeting, for affording the British Association an honorable and suitable reception on the occasion of their visit. Resolutions in furtherance of the object for which the meeting was called were proposed and seconded by Lord Eliot, M.P., Mr. Woollcombe, Colonel Hamilton Smith, Mr. Snow Harris, Mr. Prance, &c., and carried unanimously, after which the meeting separated. The meeting of the association at Plymouth does not take place until next October.—*Western Luminary.*

Zoological Society—The ordinary monthly meeting for general business was held yesterday afternoon, William Yarrell, Esq., V.P., in the chair. The report of the council stated that the receipts of the month were £247 16s.; that £506 had been received from the sale of exchequer bills; that the expenditure of the month was £100 4s., and there remained a balance in hand in favour of the society of £461. The presents to the museum and menagerie were of very minor importance. The visitors to the museum during November were 175, from whom ten shillings only were received, and to the gardens 2,516, from whom £65 4s. was received. Mr. Schomburgh, who is about to depart on a Government expedition of survey to British Guiana, was elected a corresponding member. Several valuable presents were announced to the library. The meeting, which was well attended, adjourned to Jan. 6, 1841.

VARIETIES.

A recent number of the *London Gazette* contains a notice of an intended application to Parliament in the ensuing session, for leave to bring in a bill to authorise the transfer or assignment to a company of the patents of Professor Wheatstone and Mr. Cooke, for the electric telegraphs.

Harbours of Refuge.—A memorial from the inhabitants of Margate has been presented to the Lords Commissioners of the Admiralty on the subject of that port being selected as a refuge harbour. It sets forth "that, during the recent storm, the Claudine, 600 tons, from Madras, laden with rice, indigo, and cotton, and the Westminster, 500 tons, from Singapore, laden with tea, are both stranded on the very site of the harbour proposed by the parliamentary committee;" also, "that a third vessel of equal calibre was drifting into the same bay," supposed to be the Equivalent, of Sunderland, now on shore near Kingsgate. The object of the memorial is to bring before their Lordships' attention these instances of the proof of the propriety of the situation proposed by the parliamentary commissioners, or of the neighborhood adjoining, for the reception of the proposed harbour of refuge, as the three vessels thus lost would, in all probability, have been sheltered and saved had such a harbour been in existence.

Timber Produce of British Guiana.—The fitness of the timbers for naval architecture in this region is unparalleled, and, in some instances, is said to surpass the teak. The *greenheart*, the *mora*, and sonari or sewarri, of all other woods, are most unquestionably the best adapted for ship building. Within the last ten or twelve years a considerable quantity of *brown greenheart* has been sent to Liverpool and Greenwich; and I have been told that builders, and others interested in shipping, are now of opinion, after ten years' trial of the wood, that in strength and durability it is superior to any oak, and it actually commands a higher price. Had these woods been introduced and extensively employed in the royal dockyards 15 or 20 years ago, it is the opinion of competent judges that we should not now hear much of dry-rot and Kyan's patent; and not to mention the rapid decay of vessels built of English and African oak, and the consequent frequent repairs, with what saving to Government would it not have been connected? If, therefore, the attention of the Navy Board could be drawn to the important fact that British Guiana can furnish the finest and most durable wood in the world, in sufficient quantities to supply all the ship-building establishments in Great Britain, a double benefit would arise from it, namely, the saving to Government, and the increased demand for the natural productions of the colony. The first experiment might be made to establish a dockyard for the repair of such of Her Majesty's cruizers on the West India station as draw not more than 18 or 19 feet water. The outlay of such an establishment would be trifling, if the importance of ultimate success be considered.—*Schomburgh on the Productions of British Guiana* 1840.

Drill Weaving.—An important stimulant has been offered to the weavers of fancy drills in the employ of Messrs. Thomas Taylor and Sons, manufacturers, of Barnsley, by a premium of 6s. 6d. per bunt advance, for the best woven drills; accordingly, some of the men exercised their ingenuity in applying more force to their looms, and Mr. John Kay, of Smithies, produced the first bunt so improved, on Saturday last, when the above advance was paid him; since which time all pieces equal to it have received the same advance. The compactness of the 40 shaft drill woven by Mr. Kay, and presented, was highly creditable to the weaver and very satisfactory to the manufacturers, and is an important improvement in the manufacture of fancy drills at Barnsley.—*Leeds Mercury.*

Park Gate Iron Works.—The extensive iron works in the neighborhood of Rotherham, called the Park Gate Iron Works, and carried on by a company of proprietors, principally residing in Birmingham, have been purchased by John Schofield, Esq., M.P.

Iron Works at Luxborough.—The manufacture of iron is advancing with great spirit at Luxborough, near Minehead, Somersetshire, where extensive mills, ponderous tilting hammers, and vast smelting furnaces, have been for some time past erecting, and are now nearly completed. The quality of the ore, which is raised in the Brendon Hill, about a mile from Luxborough, has been well tested, and is found so excellent as to excite the avidity of the large manufacturing houses in steel, one of which at Sheffield has taken off the entire quantity on hand, and contracted for the purchase of all that may be made within the next twelvemonths. The quality of the ore is so rich as to render it particularly valuable in the manufacture of keen and delicate instruments and highly polished goods, and some samples of it which we have seen contain at least 75 per cent. of pure iron. A new method of smelting has been adopted at these works, from the patent of Mr. Sanderson, of Sheffield, the process of which is highly advantageous, from the celerity and economy combined in the operation. The whole of the machinery, which is of beautiful construction, has been erected by our eminently scientific townsmen, Messrs. Richards and Blake. The neighborhood of these works has in consequence of the number of workpeople employed and the busy scenes of their labor, assumed a vivacity of character in perfect contrast to its former noiseless monotony. The road from Luxborough to Roadwater towards the coast, extending nearly six miles, has been widened. The proximity of those works to the opposite Welsh shore, which affords facility of fuel for their purposes, and their contiguity to the shipping port of Watchet, together with the pureness of the ore—its exhaustless abundance—and the high opinion of its quality held by the first judges, justify a confident opinion that the bold and judicious owner of the property (Sir T. Lethbridge, bart.) will promptly realise the best results of his most sanguine expectations.—*Taunton Courier.*

Unchangeable Writing Fluid.—The varieties of inks and "writing fluids" now competing for public favor render it difficult to determine to which the palm must be granted. Among the more recent candidates is the unchangeable dark blue fluid invented by Mr. Stephens, which seems, indeed, well to deserve the notice of those who prefer colored inks. It flows readily from the pen, and retains its blue color when dry, which most of the colored fluids do not.

Gum Paste.—In the course of some experiments which we made about twelve months ago with different kinds of gum, for stamped labels for letter stamps, we found that gum tragacanth, a fine Persian gum, was by far the most efficacious. By simply mixing it with water it forms a beautiful gelatinous paste, which is easily spread, and is particularly tenacious. Wishing to keep a small supply of this kind of cement always by us, and aware that if mixed with water it would be apt to become offensive, we substituted acetic acid for water, and prepared a bottle of the mixture for occasional use. It is now as effective and as free from offensive odor as it was the day when it was first mixed. This sort of preparation is particularly useful for another purpose than as a paste for paper, as when applied as a cement to reunite a limb which had been broken from a plaster image, it was found to answer the purpose remarkably well.—*Liverpool Mercury.*

Application of Beet-root.—The manufacture of sugar from beet-root is flourishing in France. The works are stated actually to number 600, employing 175,000 agricultural and manufacturing laborers. The yearly produce of beet-root sugar is already 50,000 kilogrammes; the culture is established in 37 departments; in 47 it may take root; in 3 only it has refused. Bread has been made in France from beet-root, mixed with a small portion of potatoe flour.

Improved Vinegar.—The inferiority of English vinegar, owing to the improper manner in which the acetic fermentation is generally conducted, and the want of concentration of the acid in the liquid, has been very successfully removed by the process adopted by Messrs. Grimble and Co., who have contrived to concentrate more genuine acetic acid within a given quantity of fluid than we believe has been previously effected by the English manufacturer in vinegar, intended for table use. In smell their vinegar resembles aromatic, and must prove extremely refreshing in sick rooms.

A Chapel Blown up by Gas.—In the afternoon of Saturday the residents of New Town, Holmfirth, near Leeds, were greatly alarmed by a tremendously loud noise, resembling the explosion of fire-arms, experiencing at the same time a tremor of their houses, as though caused by an earthquake. It was discovered that a quantity of gas had exploded in the adjoining chapel, by which the edifice had sustained a very great destruction, almost every window having been forced out. A number of pews in the lower part of the chapel were displaced, part of the flooring was torn up, and other damage to an alarming extent occasioned. Four individuals, who were in the building at the time, were all more or less injured. One of them, a little boy, son of the chapel-keeper, was thrown a considerable distance by the force of the gas, and on being picked up was found to have suffered a severe fracture of the thigh bone, besides numerous bruises over the body. The other three persons received various injuries, being considerably burnt about the face, having the hair singed off the head, &c. The chapel has been recently fitted up and lighted with gas. On the above afternoon the chapel-keeper entered the building for the purpose of putting a fire into the stove, taking two of his children along with him. Finding the atmosphere strongly impregnated with gas, and anxious to ascertain the cause of the escape, he obtained the assistance of John Shaw, a joiner, who, supposing the meter to be the part in fault, proceeded thither with a lighted candle. An immediate explosion was the consequence.

A Frenchman's Relief from Home.—A certain man was once seen, who spent daily six or seven hours at the Café de la Regence for 10 years; constantly occupied in poring over the players, but refusing invariably to play himself, and never even speaking a single word. A disputed point arose; the *galerie* was thin, and the taciturn veteran was pressed into the service as umpire. Sorely pushed to decide the question, Monsieur owned that, so far from being a player, he did not even know the moves of the pieces! Astonished at this, the query naturally came, "Why then waste 10 years of life in looking over the board?" The reply was, that "he was a married man, and did not care to go home!"—*Fraser's Magazine* for December.

Duty on Gloves.—The question of the reduction of duty on gloves imported is producing a lively excitement in that extensive and important trade. According to a correspondent who advocates the continuance of the present rate, the only evidence before the committee on import duty which supports in any degree the policy of reduction is that of Mr. M'Gregor, who has stated that the existing duty is constantly evaded, that he can purchase French gloves as cheap in London as in Paris, and that he was assured personally by the head of the Customs Department in France, that an extensive contraband trade in gloves was constantly going on with the English outports. This evidence is impunged by the trade as wholly inconclusive, since a little difference in the quality, not evident to a person ignorant of the trade, might easily account for the identity of price in both capitals, and the information of the Paris functionary is at least declared to be suspicious, since he must have a direct interest in the reduction of duty which is under consideration, and be desirous of extracting all the advantages possible for France out of the trade with England, without any concession in the shape of reciprocity.—*Times.*

The Theatres.—The new play of Sir Edward Lytton Bulwer, the announced production of which, at the Haymarket, excited much expectation, has been necessarily delayed owing to the death of a child of Mr. Macready, who is to take the principal part. *Money* is however to be forthcoming next week. The Adelphi has brought out another successful piece.

A patent has recently been granted by her Majesty for a new theatre royal in Glasgow, to which the Great Seal of Scotland has already been attached, and ulterior measures regarding it are in progress. The patent is granted for twenty-one years from 1840, in favor of five patentees, who are officially connected with the city or county, or any two of them. Three of these gentlemen have already agreed to accept the trust.—*Glasgow Chronicle.*

PROGRESS OF DISCOVERY AND INVENTIONS.

Dates connected with the progress of knowledge and improvements since the Christian era:—

274	Silk brought from India	1604	Satellites of Jupiter
373	The Bible in Gothic	1614	Logarithms invented
400	Bells mounted	1619	Circulation of the Blood
493	Silkworms in Europe	1623	Barometer invented
660	Organs used	1662	Royal Society established
663	Glass in England	1682	Philadelphia founded
800	The Aristotelean Philosophy introduced	1680	Air-pump discovered
830	Oxford University	1710	Newcomen's Steam-engine
991	Arithmetical Digits	1716	Death of Leibnitz
1080	Domesday Book	1720	Inoculation introduced
1124	Musical Notes	1722	Electricity improved
1200	Mariner's Compass	1726	Petersburg Academy established
1220	Astonomy cultivated in England	1730	Fahrenheit's Thermometer
1239	Coals dug as fuel	1736	Gottingen University established
1299	Spectacles invented	1753	British Museum established
1302	Cambridge University	1768	Steam-engines much improved
1319	Dublin University	1771	Cook's First Voyage
1341	Petrarch crowned at Rome	1773	Cotton-spinning Machinery
1360	Wickliffe flourished	1778	Linnæus died
1436	Printing invented	1781	Euler died
1454	University at Glasgow founded	1788	Galvanism discovered
1464	Posts and Diligences established	1797	Priestly died
1470	The first Almanac	1798	Vaccination announced
1471	Printing in England	1781	The Planet Herschel discovered.
1517	Luther began to publish		
1543	Copernican System published		
1549	Telescopes invented		
1602	Decimal Arithmetic		

ADVERTISEMENTS.

NOTICE TO THE MANUFACTURERS OF BIRMINGHAM AND VICINITY.—RICHARDSON AND BRAITHWAITE'S TINNING PATENT.—The patentees and the original inventor of the above tinning process, having been the last fortnight in the Staffordshire Potteries, granting licences to the most eminent manufacturers, beg to inform those manufacturers disposed to take licences under this patent, that the inventor will be in Birmingham during the whole of this week ready to give any information and make any experiments that may be required. Apply to Mr. Smith, Agent, 10, New-street, Birmingham; or to G. M. Braithwaite, White Lion-court, Cornhill.

BOND'S PERMANENT INK, the original invention, requiring no preparation, for marking linen, silk, or cotton, is recommended, from its universally acknowledged superiority, as affording an excellent means of security of family table linen and wearing apparel against loss or mistakes. In bottles, at 1s. each. Sold by the preparer, John Bond, chemist, 28, Long-lane, West Smithfield; also by appointment by most stationers and medicine venders. To avoid disappointment from the substitution of counterfeits, ask for the genuine article above mentioned. "Bond's Permanent Marking Ink."

HALL'S PATENT STOVES, which combine all the advantages of Dr. Arnott's invention with many peculiarly their own, are strongly recommended for the use of churches, schools, public offices, conservatories, &c., consuming a very small quantity of fuel of any description, and generating an equal, pure, and wholesome heat throughout the largest apartment, without the possibility of explosion or the dangers incidental to exposed fires. Numerous testimonials and further particulars may be obtained at Stephenson and Co.'s warehouses, 61, Gracechurch-street, City, where also may be seen Cooper's Improved Patent Central Fire Guns and Pistols. To manufacturing tobacconists, warehousemen, calico printers, &c., the above stoves are invaluable, and their portability renders them exceedingly desirable for exportation. Price £3 3s. and upwards.

THE VESTA PATENT STOVE, 70s. plain.—That a Madeira climate in England may be produced by the VESTA STOVE, plants of the most tender kind requiring warmth have proved; in sick rooms it has been found invaluable, producing one even degree of temperature throughout the day and night. The Vesta Stove has no doors, and as there is not any fire in contact with the outer case, warmth is obtained without any of the unpleasant effects complained of in the use of others. The fire can be kept alight the whole season, and the part containing the fire is not open during the time it is replenished with fuel. The fuel passes from the hod into the stove without being seen, preventing entirely any escape of the noxious vapors, and that annoyance from dust, which, in feeding other stoves, arises from the fuel being removed from the hod into the stove, or, what is worse, into a funnel to convey it into the stove. The ashes are removed without causing any dirt or dust; no raking out with portable rakers, or the hands, being necessary; and during their removal from the interior of the stove they are not visible. The cost for fuel (cinders, coke, or Welsh coal) will be about 2d. for 24 hours, during which time the stove will not require attention. The Vesta Stoves are perfectly free from all liability to explosions and such unpleasant consequences as have been met with in the use of Arnott's. A variety of sizes and patterns are made with ascending and descending flues, in iron and earthenware, suitable for warming apartments of every description, churches, ships'-cabins, &c. The Stoves may be seen in use at RIPPON and BURTON's warehouses, Wells-street, Oxford-street. A list of prices and a number of references and testimonials will be sent in answer to a paid application.

THE NATIONAL BREWING ASSOCIATION.

By the Queen's Royal Letters Patent.

Capital £200,000, in 20,000 Shares of £10 each.

BANKERS:

The Union Bank of London, Moorgate-street, and Argyll-street, Regent-street.

SOLICITOR:

W. H. Lammin, Esq., 5, John-street, Adelphi.

The object for which this Company has been formed, namely, to enable every person to manufacture their own ale and porter of genuine malt and hops, (an article of such paramount importance to the community at large,) without the usual requisite of brewing, or the use of brewing utensils, and to any strength or extent their station in life may require, at one-half the expense, and without trouble or loss of time,—must strike every person as being of the greatest national importance, and that the most profitable results must arise from such an undertaking.

To carry this desirable object into operation, the projectors of this Association, fully convinced of the efficacy of Jarvis's Patent Concentrated Extract of Malt and Hops, which requires but the simple and easy process of undergoing a fermentation, have made arrangements to secure its important advantages to the Company, and that benefit, so important to the public at large, which must result from its adoption.

The simplicity of the process, the genuine and excellent quality of the beer made from the extract, and the reasonable price at which it can be obtained, render it almost a matter of certainty that the National Brewing Association must ultimately supersede all other brewing establishments, unless availing themselves of the advantages offered by this patent.

An early meeting of the shareholders will be convened for the election of directors, auditors, and other officers.

Applications for shares, on which £1 deposit must be paid, and for prospectuses, may be made at the offices of the association, No, 17, New Bridge Street, Blackfriars, where a specimen of the extract may be seen; or to W. H. Lammin, Esq., No. 5, John Street, Adelphi, where any further information may be obtained.

WORTHY OF UNIVERSAL ATTENTION.

WARM FEET MAY BE EFFECTUALLY SECURED BY THE USE OF

JONES's THERMO-CREPIDA; OR, PATENT SHOE WARMER.

"This article of luxury and domestic comfort, needs only to be seen to be at once received into universal favor. In form it resembles a shoe-maker's 'last' (though it is of far more elegant workmanship)—is hollow—and has a short tube projecting from the heel end, to receive boiling water. When filled, there is a screw to render it air-tight * *. It may then be placed either in a slipper, a shoe, or a boot; and the heat it gives out is such, that the article intended to be warmed is as hot in a few minutes, as it would have been had it stood before the fire some hours,—with this additional advantage; no damage either to the cloth or leather is sustained by its adoption. * * To invalids, persons of a chilly or nervous constitution, ladies or gentlemen advanced in years, persons travelling in carriages, persons subject to head-ach, gout, rheumatism, lumbago, and indeed most bodily ailments—it will prove a real treasure, seeing that *to keep the feet warm* is one of the grandest secrets of health * * * We should add, that the manner in which the 'last' (which is of polished metal) is finished, gives it a very elegant appearance; indeed it bears a very close resemblance to the human foot, the deflections and general peculiarities of which are imitated and marked with wonderful precision."—*Kidd's London Journal, No.* 128.

To be had at the LIGHT HOUSE, 201, Strand; and at all respectable ladies' and gentlemen's shoe-makers, and furnishing ironmongers.

THE comparative durability of STEPHENS' Unchangeable BLUE FLUID and common BLACK INK chemically explained. Black ink is the vegetable principle of galls united to a salt of iron. Iron has a constant and inherent disposition to absorb oxygen, until the vegetable principle decays, and leaves the manuscript in a state of iron mould. Ferro-prussiate, which is the basis of the unchangeable blue fluids, forms the deepest blue color when united to iron in the highest state of oxidation, and, if the iron is de-oxidised by light, the color passes to a lighter shade, but the constant disposition of iron to re-absorb oxygen is a never-failing source of the eternal preservation of the color; also the ferro-prussiate surpasses all other agents in its attraction for iron, and unlike animal or vegetable substances, which have an inherent disposition to pass to their original elements, it is not subject to spontaneous decay, and is unaffected by acids, or chlorine, which latter being used to bleach rags for paper-making, has been found to affect the writing from common ink. Stephens' Unchangeable Blue Ink is therefore more permanent and better fitted for all the purposes of writing than other colors.—Henry Stephens, 54, Stamford-street, Blackfriars-road, and sold by all stationers and booksellers.

VINEGAR.—"It is generally the rule to judge of the progress of any country towards civilization by the advances made by it in the arts and sciences. Should any one so judge of us by our manufacture of vinegar, how wofully deficient should we appear in our boast of being the most civilized nation in the world."—Polytechnic Journal, The acknowledged superiority of foreign vinegars, both for quality and flavour, having induced Messrs. GRIMBLE and Co., to give the subject an attentive consideration, they have now the satisfaction to inform the public that they have succeeded in manufacturing a VINEGAR, equal if not superior, in the estimation of the best judges, to that of any foreign country. The agreeable flavour, unalterable purity, and brilliancy of this commodity, and consequent adaptation for pickling, render, in this respect the Royal Orleans a vinegar surpassing in quality that of the finest continental production. The use of salads, so conducive, medically speaking, to the preservation of health, has been injuriously abridged at our tables in consequence of the inferior, or, at all events, uncertain qualities of vinegar as usually prepared in this country. Owing to this cause our pickles and salads are but little esteemed and sparingly used, whilst they are wholly rejected by the foreigner and continental traveller. In order to enable the public fairly to judge of this vinegar in its genuine state, the following are a few of the Italian warehouses where it may be obtained in sealed bottles, at 1s. each, bottle included, or in any quantity:—Finch and Co., 11, Ludgate-hill; W. D. Prichard and Co., 36, Devonshire-street, and 50, Leadenhall-street; R. and C. Faulkner, 44, Jermyn-street, St. James's; Robert Wood, 132, New Bood-street; Barraugh and Fall, 1, New Cavendish-street; W. Hughes, 12, King-street, St. James's; Frost and Hardstaff, 89, High-street, Camden-town; Lawsons, 33, Coleman-street; J. Jackson, 194, Edgeware-road; R. Howse, 47, Albany-street; W. Darby, 6, Queen's-buildings, Knightsbridge; H. Smith, 146, Shoreditch; Robinsons, 10, Great Russell-street, Covent-garden; H. Bentham, 62, Piccadilly; E. and J. Taylor, 17, Lower Holborn; Zetterquist and Son, 60, Blackfriars-road; H. Collins, 88, Fleet-street; Thomas Fraser, 63, New Bond-street; Sledden and Stocking, 42, High-street, Marylebone; J. Garnett, 38, Wigmore-street; Riches and Son, 3, Charles street, Parliament street; W. Clark, 74, St. John-street; E. Ashby, 1, Old Broad street; Christopher Heron, Uxbridge, Middlesex; Walkers, Thistle-grove, Little Chelsea; C. Young, High-street, Islington.

LAW OF PATENTS.

ALL WORKS PUBLISHED on the PATENT LAWS of Great Britain and Foreign Countries, and all the PERIODICALS relating to INVENTIONS, MANUFACTURES, RAILWAYS, STEAM NAVIGATION, SCIENCE, and the ARTS, are to be had at

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SCIENTIFIC PERIODICALS.

Art-Union.
Athenæum.
Chemist.
Civil Engineer and Architect's Journal.
Literary Gazette.
London Journal of Arts.
Magazine of Science.
Mechanics' Magazine.
Mining Journal.
Philosophical Magazine.
Polytechnic Journal.
Railway Magazine.
Railway Times.
Repertory of Arts.
Transactions of the Society of Arts.

ACTS OF PARLIAMENT.

PATTERNS,—
27 Geo. III., c. 38; 2 Victoria, c. 13; 2 Victoria, c. 17. (The last relates to patterns and *models.*)

PATENTS FOR INVENTIONS,—
2 and 3 Victoria, c. 67.

SCULPTURES,—
38 Geo. III., c. 71.

ENGRAVINGS,—
7 Geo. III., c., 38; 17 Geo. III., c. 57.

COPYRIGHT,—
8 Anne, c. 19: 12 Geo. II., (Booksellers' Act), c. 36; 5 Geo. III, (Universities' Act), c. 53; 54 Geo. III. (General Copyright), c. 156.

FIRE PREVENTIVE CEMENT WORKS, Upper Ground Street, Blackfriars Bridge.—The Directors are now enabled, by means of the recent improvements made in the works, to SUPPLY Builders, &c., with the PATENT FIRE PREVENTIVE CEMENT at a very reduced price, for the utility of which they beg to refer to the various severe tests and experiments which have been made upon it in London, Manchester, St. Petersburgh, and Philadelphia, as reported in the Chronicle, Herald, and scientific publications at the period. See also the report in the Times of the 2d of September in this year, in which they state that, after the proof given of its resisting and non conducting properties, it required only to be known to be universally adopted in all buildings.

HENRY FLOWER, Secretary.
J. B. SHEPHERD, Surveyor.

INSTANTANEOUS LIGHTS.

JONES'S PROMETHEANS.—The advantages the Promctheans possess over all other instantaneous lights, are their extreme simplicity and durability, as neither time nor climate can impair their original quality. They are composed of a small glass bulb hermetically sealed, containing about a quarter of a drop of Sulphuric Acid, encompassed by a composition of the Chlorate of Potash, enclosed in Wax Papers or Wax Tapers; the latter will burn sufficiently long for sealing two or three letters. The PROMETHEANS being pleasant to use, and never failing in their purpose, are rendered nearly as cheap as the common Lucifers. To be had of all respectable Chemists, &c., or at the Manufactory, 201, Strand.

THE RAILWAY MAGAZINE, AND COMMERCIAL JOURNAL. By JOHN HERAPATH, Esq. Mines, Steam Navigation, Banks, Canals, Docks, Assurances. Published Weekly, price FIVE-PENCE Stamped, at Half-past Six on Saturday Mornings.—This long-established work (the oldest Railway periodical), being independent and wholly free from sinister influences, contains full and accurate Reports of all Railway Meetings, with Directors' and Engineers' Reports, and all information relating to Railways; unique Share Lists for London and Liverpool, &c.; the best Tables of Traffic extant, &c. Amongst other exclusive matter is the *Times of Starting of all Railway Trains*, giving most important information for travellers and commercial men. This Paper, which has the largest circulation of papers devoted to Mining, contains *Weekly Reports of Mining Companies*, exclusively furnished to it; Reports of the Meetings, Prices of Metals, Mining Intelligence, &c. For intelligence relating to Steam Navigation, the Magazine has long been known. It gives every week a *Steam Vessel Tide Table*, showing the time of tide every day for every port in England. On *Banking, Life Assurance, &c.*, much valuable original matter has been given in the Magazine, as well as upon all subjects relating to Joint Stock Companies. Accounts of new Companies, List of Meetings, Calls and Dividends, Share Lists, &c. Many original articles and much exclusive information are given on Scientific and Mechanical subjects, with occasional Engravings, Reviews, &c. As a medium for *Advertisements*, the "Railway Magazine and Commercial Journal," from the nature of its circulation, possesses peculiar advantages. Among the Advertisements which are inserted in this paper are—Companies.—Railway, Mining, Asphalte, Steam Navigation, Banking, Life, Fire, and Marine Assurance, Canal, Dock, Gas, Water-work, Cemetery, Paving, Dry Rot, and all Joint Stock Companies; Discount and Loan Societies. Sales of Shares, Landed Property, Collieries, Mining Materials, Iron Works, Foundries, Factories, Steam Engines, Actions, Contracts:—Public Works, Books, Travelling:—Railway Trains, Coaches, Steam Boats, Hotels, Patent Inventions. Engineering and Mining Colleges, Scientific Institutions, Exhibitions, &c.—Published at 3, Red Lion Court, Fleet Street, and to be had of all Booksellers and Newsmen.

ROBBERIES of PLATE and JEWELS.—A LOCK, completely calculated for plate and jewel chests, has just been invented, on a new and scientific principle, which affords far greater security against the robber and housebreaker than any one yet invented. It is utterly impossible to introduce a false key, picklock, or any other instrument whatever into it; and, moreover, though the owner of the lock may have forgotten or mislaid the key no one can successfully use it unless he is acquainted with the secret of so doing. WILLIAM MARR is the sole inventor, manufacturer, and vendor of this lock, to render still more secure his patent fireproof strong rooms, safes, iron doors, and boxes.—52, Cheapside, and 33, Bread-street.

THE SHIPPING AND MERCANTILE GAZETTE, London Evening Journal of Maritime, Commercial, and Political News,—combining all the essentials of a Daily Newspaper, with the prominent features of complete and exclusive intelligence on every subject connected with the Shipping and Trade of the United Kingdom The Shipping Gazette has obtained a character for correctness and usefulness unprecedented in the annals of Newspapers. It now commands an extensive circulation throughout the United Kingdom and the Colonies, on the Continent of Europe, in the United States of America, and other foreign countries; and is therefore a most eligible medium for commercial and miscellaneous advertisements, particularly those that relate to the sale, charter, freight, equipment, and sailing of vessels, and the sale of merchandise, and that have for their object the particular attention of Merchants, Ship-Owners, and Mariners, and those having dealings with them. The establishment of the Shipping Gazette forms a new era in the history of Shipping Intelligence; comprising, as it does, daily and complete announcements of the arrival and sailing of all vessels, in the coasting and foreign trades, together with an accurate account of vessels spoken at sea; state of winds and weather; accidents; losses; rates of foreign and coasting freights; premiums of insurance; wholesale prices of goods; stock-exchange news; coal, corn, and other markets; which information is regularly furnished and derived from the most authentic sources at home and in foreign countries trading with Great Britain. The Shipping Gazette further embraces a comprehensive detail of domestic and miscellaneous intelligence; records of all important events; reports of parliamentary proceedings, public meetings, decisions of law and police courts, &c., especially such as refer to nautical and commercial matters; and altogether contains a larger mass of information than is afforded by any other Evening Newspaper. The Shipping Gazette is frequently referred to by witnesses examined before Committees of the House of Commons, as furnishing the most authentic evidence on maritime affairs. Orders, communications, and advertisements for the Shipping and Mercantile Gazette, are received by its Agents at the respective out-ports, and by any News Agent in town or country. Advertisements and communications to the Editor, may be sent to the Publication Office, No. 54, Gracechurch Street, London.

FRANKS'S SPECIFIC SOLUTION OF COPAIBA.

THE Efficacy of this INVALUABLE MEDICINE is attested by Testimonials

From JOSEPH HENRY GREEN, Esq., F.R.S., *one of the Council of the Royal College of Surgeons of London, Surgeon to St. Thomas's Hospital, and Professor of Surgery in King's College.*

BRANSBY B. COOPER, Esq., F.R.S., *Surgeon to Guy's Hospital, Lecturer on Anatomy, &c.*, and others of high and deserved repute in the Medical Profession, as the most *certain, safe, and speedy cure* for those diseases particularly described in the directions accompanying the Medicine.

Prepared only by GEORGE FRANKS, Surgeon, 90, Blackfriars-road, London, and may be had of all Wholesale and Retail Medicine Vendors in the United Kingdom, in Bottles at 2s. 9d., 4s. 6d., and 11s. each.

CAUTION.—None is Genuine, unless "*George Franks, Blackfriars Road,*" is engraved on the Government Stamp attached to each bottle.

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Also

HOLMES's Patent for Improvements in Naval Architecture, and Apparatus connected therewith.

"All persons who examine this patent, must admit Mr. Holmes to have fully established the principles insisted on in his report to the East India Committee, in 1838, of the practicability of building iron ships without limits to size, and on the indispensable necessity of the adoption, not only of much larger ships than had been contemplated, but that it was equally indispensable, in point of profit, that they should be built of iron, and by the adoption of his improvements a great reduction in the first cost and in the wear and tear would be effected. Many parts of these improvements are, however, equally applicable to wood ships, as regards safety to the passengers; and wherever they are adopted, we cannot conceive any case or circumstance in which a ship can be placed in danger. In the fullest sense of the word, they become life-boats, without waste of room, or extra cost."—*From the "Inventors' Advocate," July 1.*

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Mining Journal Office, 37, New Broad-street, City, 27th June, 1840.

NEW WORK ON THE IRON TRADE.

The Number of the MINING REVIEW this day published, contains the Sixth Part of the Paper on the IRON TRADE, by Harry Scrivenor, Esq.—this work will be completed in Twelve Monthly Parts, and so arranged as to form a separate volume at the end of the year; in addition to which the MINING REVIEW contains—A Paper on the Establishment of a School of Mines—On the Ventilation of Mines, by Samuel Moyle, Esq., C.E.—On the Preparation of China-Clay, by W. J. Henwood, Esq., F.R.S., &c.—On Blasting Limestone Rock, being an Account of Blasting the White Limestone in the Country of Antrim, Ireland, by William Bald, F.R.S.E., M.R.I.A.—On the Applicability of Peat to Manufacturing Iron—Parliamentary Returns of the Imports and Exports of Copper, Lead, and Tin, for the year ending 5th January, 1840—Scientific Bodies, &c.—The MINING REVIEW is published at the office, as above, on the 1st of each month, price Sixpence.

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THE

INVENTORS' ADVOCATE,

AND JOURNAL OF INDUSTRY;

A WEEKLY BRITISH AND FOREIGN MISCELLANY OF

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ON THE PERCUSSIVE ACTION OF STEAM.

A subject of much interest was mooted and discussed at a recent meeting of the Institution of Civil Engineers, relative to the action of steam in expansive engines. In a paper by Mr. Josiah Parkes,—an abridgment of which, with a report of the discussion, was published in a late number of our Journal,—he contended, that in those engines there is a greater amount of work performed than can be accounted for by the quantity of steam employed, if its elastic force alone be taken into account. From experiments made with the Huel Towell engine, he was led to infer, that there is a difference of power as compared with the resistance overcome, of above three pounds on the square inch of the piston; and in other Cornish engines, of full four pounds per square inch. From these results he concluded, that in these engines the sudden rush of steam from the boiler to the cylinder, which is effected by the construction of the admission valves, causes it to strike against the piston, and communicate to it a momentum, in addition to the elastic force of the steam. This, he is of opinion, will fully account for the extra work which, according to the experiments, is performed. The supposed additional power thus acquired, Mr. Parkes calls the "percussive force" of steam, to distinguish it from the elastic force.

This notion that the "percussive force," or impulse, of steam might be advantageously employed, as well as its elastic power, has been entertained by other practical engineers, and by theoretical mechanicians; but whether these two forces are capable of application at the same time, is a question that yet remains to be decided. We shall now endeavor to show, that at all events the ingenious theory of Mr. Parkes, which supposes the percussive force to operate advantageously on the pistons of steam engines, must be founded in error; and that the extra work alleged to be performed by the Cornish engines, remains to be otherwise accounted for.

It must be evident, that if the percussive force be gained by the sudden rush of the steam into the cylinder, the more suddenly the communication between the cylinder and the boiler is effected, the greater ought to be the percussive action. Now, let us suppose that the bottom part of the cylinder was fixed to the top of the boiler, and that a slide-valve were so constructed as to open the communication between the boiler and the whole area of the piston instantaneously. We assume that by this management there could be no percussive force acting on the bottom of the piston, for it would form, in fact, a part of the boiler itself; the effect of the removal of the slide-valve being to bring the whole area of the piston into immediate communication with the steam in the boiler. There would, in such case, be no rush of steam against the piston, which would be acted on only by the expansive force of the steam. If there be no action of percussive force in such a case, must it be inferred, contrary to all experience, that high pressure steam exerts more power on the piston when the communication with the steam in the boiler is less direct and less sudden? We scarcely think that this will be asserted, and yet, in the case we have assumed, of the most complete and sudden communication of steam to the piston, there can be no more "percussive" action than there is against the top of the boiler itself.

When the steam is conveyed to the cylinder in the regular way by a pipe from the boiler, and is admitted through a lateral aperture into the cylinder, the percussive force, if any, must be directed against the opposite side of the cylinder, and not on the area of the piston. But let the steam, after passing through the pipe, be admitted into the cylinder through an opening directly underneath the piston, so as to communicate to it the whole momentum which the sudden rush of steam is supposed to possess; even in such an advantageous arrangement for the application of this assumed additional force, there would, we contend, be no power called into action beyond that of the expansive force of the steam. The arrangement we have supposed would be, in fact, only a modification of that at first assumed, of fixing the cylinder to the top of the boiler, with this disadvantage, that the communication would not be so complete and the steam would be "wire-drawn," in proportion to the length of the pipe. There cannot, in point of fact, be any rush of steam at all, by which a percussive force could be imparted, unless there be some comparative vacuum between the slide-valve and the area of the piston. When there is a comparative vacuum of this kind, the impulse, or "percussive force" of the steam may come into action to a certain extent, but it is accompanied with a great waste of steam in afterwards filling up the vacant space. It is thus that the percussive force of steam exerts its energy when escaping into the air, or acting in a rotary steam-engine; but in these cases the steady elastic force of the steam is completely inoperative.

The notion that power may be gained by using the impulsive force of steam as well as its elastic force, is derived from the well-known fact that a steam jet possesses great motive powers, and that bodies exposed to the accumulated action of steam in tubes acquire great velocity. But it is forgotten that in all these cases the steam must act in a comparative vacuum, or no effect will be produced. Were Perkins's steam-gun to be fitted with a piston working against a resistance equal to the pressure of the steam, the bullets would merely press against it, if the piston were forced up close; or, if there were a vacant space between them, the "cushion" of air between the piston and the bullet would soon stop its motion.

It is only, we repeat, when there is a comparative vacancy that there can be what is termed *a rush of steam* from the steam-pipe against the piston in the cylinder of a steam-engine; and if any vacancy existed there would be a decided loss of steam power. The idea, therefore, that any power is gained by the percussive action of the steam on the piston in the Cornish engines, must be erroneous. If the work they perform be greater than, by the ordinary means of estimation, can be accounted for, the discrepancy most probably arises from errors in the calculation; but at all events, we feel assured that the percussive force of steam applied in the cylinder can have no advantageous effect, even allowing such a force to have any operation. The experiments which Mr. Parkes adduces, are indeed strong proof of the advantages of working steam-engines expansively; the nature of which we shall take an early opportunity of explaining more fully.

STEAM-ENGINES WORKED BY THE WASTE HEAT OF FURNACES.

The numerous forests of France, promising to perpetuate in that country the use of wood in the manufacture of iron, every improvement made in the forges worked on that principle is of great importance to the future progress of that manufacture. The following statements relative to the new manufactory of Gorcy will, therefore, be read with interest:—The furnaces and iron manufactures of Gorcy (Moselle,) constructed by MM. Thomas

and Laurens, and worked by steam-engines, that are set in motion only by means of the heat which escapes from the furnace, have been in operation for many months. The complete success that has attended the efforts of these engineers have justified their predictions, that the heat which escapes from the refining furnaces, and the combustion of the gas which they emit, would be sufficiently powerful to act on their steam bellows and hammers. We hasten to add that this adaptation of the superfluous heat to the formation of steam does not prevent the reheating of the iron by the heat escaped for the manufacture of small articles and thin iron plates, such as are used in Franche-Comté; that it does not prevent the heating of the air that is used for the blast, nor the previous heating of the pigs of iron, and that all these advantages may be combined in the same manufactory. At the forge of Gorcy the actual production of each furnace is from 20 to 23,000 kilogrammes of iron, of different qualities. The consumption of the fires, coal and metal, does not exceed that of the best manufactories, and it is even less than the quantity consumed in the generality of forges. The steam engines of Gorcy, of a simple and solid construction, move the hammers with the greatest ease in any direction the forger requires, without occasioning any fatigue. Forges can now be constructed with the certainty of success arising from experience, without the necessity of having a fall of water, by making use of steam-engines which do not consume any coal, and by rendering it unnecessary, when seeking for suitable situations for such establishments, to find one where there is a sufficient current of water for a moving power.

The old forges worked by water power will also derive an advantage from these arrangements, for they will probably have the opportunity of adding to their manufacture small bars or iron plates, without incurring any expense, or without any greater consumption of coal; since the heat which escapes from their furnaces is made use of as the motive power of the engines, and also for re-heating the bars or the iron plates.

The new steam-engines will enable them to avoid the interruptions to which the water-working machinery is liable during floods and droughts.

It is known that a great number of blast furnaces are worked by steam engines, the heat of which is derived from the gas which the furnaces produce. Refining furnaces with hammers worked by steam engines so set in motion, have also been invented. We are indebted for the latter invention to the same engineers who introduced the former one, Messrs. Laurens and Thomas. It is in fact from the construction of the steam-engine of Echallonga, made five or six years ago by these engineers, that may be dated the numerous applications that have been made of the gas of blast furnaces to the production of steam. Since this time, Messrs. Laurens and Thomas have made a quantity of apparatus for the purpose of rendering the gas of blast furnaces useful, whether heated by charcoal or coke. Their method of conducting the gas collected in the body of the blast furnaces, is worth notice, because it admits of carrying the gas to a great distance, of distributing it in different apparatus without its being necessary to close the mouth of the furnace, or to make use of a ventilator or of any other machine. The mouth of the furnace remaining open, it may be charged in the usual manner, and nothing in the process of the blast furnaces is disarranged. This system possesses the no less important advantage of allowing the gas constantly to escape, and this once inflamed in the stove adapted to the purpose is kept constantly burning.—*Moniteur Industriel.*

ON THE PREPARATION OF LIME AND CEMENT FOR BUILDING.

M. Vicat recently read a paper on this subject before the French Academy of Sciences. It is known that hydrates of lime become cements when they contain a certain quantity of clay. In this transition between clay and limestone, compounds are found which appear to partake of the properties of hydrate of lime and of cements; which when put to the test are neither one nor the other. These compounds, which M. Vicat calls imperfect limestones, being thoroughly burnt, that is, having all their carbonic acid expelled, and used as cements, have precisely the same effect, but the cohesion that instantly ensues is in the course of a few hours gradually destroyed, and instead of producing a good water cement it is scarcely of any use.

Water limestones also possess very singular properties. They are capable of forming either good cements, or substances without any adhesive force, according to the different degrees of burning to which they have been subjected. It may be therefore imagined how great must be the perplexity of the workman, who endeavours to ascertain the properties of the water cement he employs. It is with the intention of giving information on these subjects to builders, that M. Vicat has undertaken the investigation which he mentions in his paper; the results of which we shall content ourselves with relating in the following terms.

1st.—There is found in the division between hydrates of lime and cements a kind of limestone containing from 53 to 100 parts of aluminous earth, and which apparently possesses the properties of cement, and adheres in the same manner, but after a certain time the adhesive action becomes gradually destroyed. These limestones should consequently never be employed for building.

2d.—A preparation of good water lime cement cannot be obtained by mixing pure quick lime with cements, properly so called, because the time required for mixing the former is much greater than the latter require; therefore it is impossible to prevent stirring the lime for a longer time than the cement takes to set.

3d.—Every kind of argillaceous limestone capable of producing a cement when thoroughly burnt also yields a cement by a less degree of burning, provided that the quantity of clay to that of lime does not exceed from 73 to 100. Now this allows a great latitude for the burning of cement. It is evident that too much calcination is the thing most to be feared, and when scorification commences all energy is destroyed.

4th.—Every kind of argillaceous limestone, capable of yielding an imperfect limestone or a good water cement, in consequence of being well burnt, is, when not burnt so much, capable of yielding a cement, or at least a product which has all the properties of cement, provided that the quantity of clay to the portion of pure lime is not above from 64 to 100; for beyond this proportion not only do the substances burnt cease to be cements, but they may even be classed with the least powerful of mortars, and with the additional inconvenience that the adhesive power they possess is liable to gradual extinction. Now, as no practical means are known of ascertaining, at first sight, unburnt cements from those which are not so; and still less of regulating the burning so as to expel from the large and small pieces of lime the requisite quantities of carbonic acid; it results, that by pulverising the burnt cement to mix indiscriminately in the mortar, as has in some instances been done, it is possible, that instead of the mortar being improved, some really destructive agent has been introduced.

5th.—Every trial tending to prove the quality of a hydrate of limestone ought to be preceded by an experiment to discover the quantity of carbonic acid contained in these limestones; for if the carbonic acid is in large quantities the trial may indicate the hydrate of lime to be bad, which if properly burnt would perhaps possess all the requisite strength.

After reading his paper, M. Vicat repeated what he had formerly said with respect to the difficulty of employing mortar with too much lime in it in building, and attributes to this cause many of the disasters which have taken place at Lyons in consequence of the inundation. He says that many of the houses were carried away, owing to the soaking of the water into their foundations; but in many instances the surrounding soil being solidly paved no soaking of water could take place, and the cause of the falling down of the walls is to be attributed to their being built of limestone, and the mortar made with too much lime, which lost all its adhesive power as soon as it became wet;—indeed at the time the walls were built their solidity was occasioned by their being exposed to the air, and not by any real adhesive properties.

METHOD OF ANALYSING SULPHUROUS WATERS.

Being occupied in making a complete history of the fine establishment which has lately been founded near the sources of Allevard (Isere), M. Dupasquier has devoted himself, with peculiar care, to the analysis of the sulphurous water which they so abundantly yield. He has studied it very accurately, and his investigations have led to the discovery of a process, as simple as delicate, for detecting and ascertaining the proportion of hydro-sulphuric acid, free or combined, contained in mineral waters.

Tincture of iodine, poured into a liquor impregnated with hydro-sulphuric acid, completely decomposes that acid, and so instantaneously, that it is very easy to ascertain the point at which its decomposition is finished, and when the iodine no longer enters into combination. Setting out from this observation, which is his own, it occurred to M. Dupasquier that, by using a carefully prepared tincture of iodine, he might be able, from the quantity of iodine required for saturating a quart of sulphurous water, to deduce the proportion of free or combined hydro-sulphuric acid which it contained.

This opinion has been confirmed by experiment, and M. D. has rendered his new method of analysis extremely convenient, by means of an instrument which he calls a sulpho-hydrometer. This instrument is a graduated tube, filled with tincture of iodine, one extremity of which is closed by a cork, whilst the other is tapered, and terminates in a capillary aperture, which allows the tincture of iodine to run out, drop by drop, when the cork is removed.

To use the sulpho-hydrometer, a given quantity of sulphurous water is poured into a porcelain capsule; a few drops of a very clear solution of starch are then added; then the tincture of iodine is gradually dropped into it, taking care to assist the action by stirring. So long as any traces of hydro-sulphuric acid remain, the iodine deprives it of hydrogen, precipitating its sulphur, and immediately disappears, without coloring the starch; but from the time that the saturation is complete, the least trace of free iodine is sufficient to communicate to the liquor a fine blue color. The number of degrees that the tincture of iodine is lowered in the sulpho-hydrometer, must then be reckoned; each degree represents 1 centigramme of iodine, and each tenth of a degree 1 milligramme. The quantity of iodine necessary to saturate a quart of sulphurous water being thus given, it is very easy to ascertain how much hydro-sulphuric acid the water contained, by determining the equivalent of the iodine in the hydrogen, the volume of which being known, we have that of the hydro-sulphuric acid.

To render the use of his instrument more easy, M. Dupasquier has prepared a table, indicating in weight and bulk the quantity of hydro-sulphuric acid, represented by 1, 2, 3, &c., 100 centigrammes, 1, 2, 3, &c., milligrammes of iodine.

This mode of analysis, independent of giving results of the strictest accuracy, has also the advantage of being so expeditious, that fifteen or twenty experiments may be made in less than an hour. It is also so simple, that it is not necessary to be a chemist to determine the proportion of hydro-sulphuric acid contained in a mineral water; any intelligent person may ascertain the variations in the strength of sulphurous waters, caused by atmospheric influences, or by the mixture of rain water. Among other advantages which this method presents, M. Dupasquier holds up to notice its extreme

delicacy, which is so great, that it indicates the precise quantities of hydro-sulphuric acid in waters on which other re-agents would have no action, although they evidently exhibited a sulphurous character. Tincture of iodine may, indeed, he has ascertained, unequivocally detect one drop of a concentrated solution of an alkaline hydro-sulphate, diluted in a hectolitrs of water, whilst other known re-agents become powerless when it is diluted in ten quarts.—*Annales de Chimie et de Physique.*

CORROSION OF IRON IN WATER.

A paper by Mr. Robert Mallett "On the Corrosion of Cast and Wrought Iron in Water," has been presented to the College of Civil Engineers, as one of the competing essays for the Telford premiums. The author having been long engaged in making experiments on this subject at the request of the British Association, refers, in the introductory part of this paper, to the contents of that report, which may be viewed as a "*prècis*" of the state of our knowledge on the subject to the year 1839, together with original researches, forming the basis of the present results. This communication is accompanied by a most elaborate set of tables of results. From these it appears, that the metallic destruction or corrosion of iron is a maximum in clear sea water of the temperature of 115° F.—that it is nearly as great in foul sea water—and a minimum in clear fresh river water. Iron, under certain circumstances, is subject to a peculiar increase of corrosive action—as, for instance, cast-iron piling at the mouth of tidal rivers —from the following cause. The salt water being of greater density than the fresh, forms at certain times of tide an under current, while the upper or surface water is fresh; these two strata, of different constitution, coming in contact with the metal, a voltaic pile of one solid and two fluid elements is formed; one portion of the metal will be in a positive state of electrical action with respect to the other, and the corrosive action on the former portion is augmented. The lower end of an iron pile, for instance, under the circumstances just mentioned, will be positive with respect to the other, and the corrosion of the lower part will be augmented by the negative state of the upper portion, while the upper will be *itself* preserved in the same proportion. From this theoretical view may be deduced the important practical conclusion, that the lower parts of all castings subject to this increased action should have increased scantling. The increased corrosive action of *foul sea* water may be referred to the quantity of hydrosulphuric acid disengaged from putrifying animal matter in the mud, converting the hydrated oxides and carbonate of iron into various sulphurets, which again are rapidly oxidized further under certain conditions, and becoming *sulphates* are washed away. Hence the rapid decay of iron in the sewage of large cities, and of the bolts of marine engines exposed to the bilge water. The corrosive action being least in fresh water may be partly referred to this being a worse voltaic conducting fluid than salt water. It appears also that wrought iron suffers the greatest loss by corrosion in hot sea water; which fact has led the author to inquiries, with reference to marine boilers, at what point of concentration of the salt water, whether when most dilute, after the common salt has begun to deposit, or at a farther stage of concentration, the corrosive action on wrought iron is the greatest, and he points out the important practical use which can be made of this information. It appears also, that the removal of the exterior *skin* of a casting greatly increases the corrosive action of salt water and its combined air, so that the index of corrosion under these circumstances is not much less than that of wrought iron, and in clear river water is greater. It farther appears, that chilled cast iron corrodes faster than the same sort of cast iron cast in green sand, and that the size, scantling, and perhaps form of a casting, are elements in the rate of its corrosion in water. The explanation of these facts is to be found in the want of homogeneity of substance, and the consequent formation of numerous voltaic couples, by whose action the corrosion is promoted. It is also observable that the corroded surface of all these chilled specimens is tubular. It appears also that in castings of equal weight, those of massive scantling have proportionately greater durability than those of attenuated ribs and feathers. Hence appears also the great advantage of having all castings, particularly those intended to be submerged, *cooled in the sand*, so as to insure the greatest possible uniformity of texture. The principles now stated afford an explanation of the fact often observed, that the back ribs of cast iron sheet piling decay much faster than the faces of the piles. It is also probable that castings in dry sand and loam will, for these reasons, be more durable than those cast in green sand. The general result of all these experiments gives a preference to the Welsh cast iron for aquatic purposes, and to those which possess closeness of grain. Generally, the more homogeneous, the denser and closer grained, and the less graphytic, the smaller is the index of corrosion for any given specimen or make of cast iron. The author next proceeds to the important question of the protection afforded by paints and varnishes. White lead perishes at once in foul water, both fresh and salt; and caoutchouc dissolved in petroleum appears the most durable in hot water, and asphaltum varnish or boiled coal tar laid on while the iron is hot under all circumstances. Accompanying tables contain the results as to the corrosion of cast iron in sea water when exposed in Voltaic contact with various alloys of copper and zinc, copper and tin, or either of these metals separately, per square inch of surface. It appears that neither brass nor gun-metal has any electro-chemical protective power over iron in water, but on the contrary promotes its corrosion. This question is only a particular case of the following general question; viz., if there be three metals, A, B, C, whereof A is electro-positive, and C electro-negative, with respect to B, and capable of forming various alloys, 2 A + C. . A + C . . . . A + 2 C: then if B be immersed in a solvent fluid in the presence of A, B will be electro-chemically preserved, and A corroded, and *vice versâ*. If B be so immersed in the presence of C, B will be dissolved or corroded, and C electro-chemically preserved; the amount of loss sustained in either case being determined according to Faraday's "general law of Volta-equivalents." The tables show that the loss sustained by cast iron in sea water, as compared to the loss sustained by an equal surface of the same cast iron in contact with copper, is 8.23 : 11.37; and when the cast iron was in contact with an alloy containing 7 atoms of copper and 1 of zinc, the ratio was 8.23 : 13.21; so that the addition in this proportion of an electro-*positive* metal to the copper produces an alloy (a new metal, in fact) with higher electro-negative powers, in respect to cast iron, than copper itself. The author discusses many results equally remarkable, and is therefore enabled to suggest by its chemical notation the alloy of "no action," or that which in the presence of iron and a solvent would neither accelerate nor retard its solution, one of the components of this alloy being slightly electro-negative, and the other slightly electro-positive, with respect to cast iron. These results will also enable some advances to be made towards the solution of the important problem proposed by the author in his former report, viz. "the obtaining a mode of electro-chemical protection, such that while the metal (iron) shall be preserved, the protector shall not be acted on, and the protection of which shall be invariable." Another table exhibits especially the results of the action of sea water on cast iron in the presence of copper and tin or their alloys. It appears that copper and tin being *both* electro-negative with respect to cast iron, all their alloys increase or accelerate the rate of corrosion of cast iron in a solvent, though in very variable degrees; the maximum increase is produced by tin alone, thus indicating that this metal (contrary to what was previously believed) is more electro-negative to cast iron than copper. Hence the important practical deduction, that, where submerged, works in iron must be in contact with either alloy, viz. brass or gun-metal; common brass, or copper and zinc, is much to be preferred. These experiments will also serve to demonstrate the fallacy of many of the patented so-called preservatives from oxidation, which are brought before the public with so much parade. The author lastly proceeds to the subject of the specific gravity of cast iron, tables of which are added to the preceding. The specific gravities here recorded were taken on equal sized cubes of the several cast irons cut by the planing machine, from bars of equal size, cast at the same temperature, in the same way, and cooled in equal times. Many of these results differ considerably from those given by Dr. Thompson and Mr. Fairbairn, which the author refers to the probability that those of Dr. Thompson were taken from pieces of the raw pig, and those of Mr. Fairbairn by weighing in air equal bulks cut from the mass by the chisel and file, by which latter process the volume is liable to condensation. The experiments of Mr. Fairbairn and Mr. Eaton Hodgkinson seem to show that the ultimate strength of cast iron is in the ratio of some function of the specific gravity dependent upon the following conditions: viz. 1. the bulk of the casting; 2. the depth or head of metal under which the casting was made; 3. the temperature at which the iron was poured into the mould; and 4. the rate at which the casting was cooled. In another table all the irons experimented on are arranged in classes, according to the character of the fracture: for which purpose the terms— 1. silvery, 2. micaceous, 3. mottled, 4. bright grey, 5. dull grey, and 6. dark grey, have been adopted by the author as a sufficient basis on which to rest a uniform system of nomenclature for the physical characters of all cast irons, as recognisable by their fracture; and it is to be wished that experimenters in future would adopt this or some other uniform system of description, in place of the vague and often incorrect characteristics commonly attached to the appearance of the fracture of cast iron. A twelfth and last table contains the results of a set of experiments on the important subject of the increase of density conferred on cast iron, by being cast under a considerable head of metal, the amount of which condensation had not been previously reduced to numbers. It shows this increase of density in large castings, for every 2 feet in depth, from 2 to 14 feet deep of metal. A very rapid increase of density takes place at first, and below 4 feet in depth a nearly uniform increment of condensation. The importance of these results is obvious; for if the ultimate cohesion of castings is as some function of their specific gravity, the results of experiments in relation to strength, *made on castings of different magnitudes, or cast under different heads*, can only be made comparable by involving their variable specific gravities in the calculation.

PATENTS.—BRITISH AND FOREIGN.

SPECIFICATIONS OF ENGLISH PATENTS.

ENTERED AT THE ENROLLMENT OFFICE.

(*Continued from page* 323.)

WILLIAM BUSH, of Camberwell, merchant, *improvements in fire-arms and in cartridges*, (being a communication), Nov. 20.—These improvements consist, first in the construction of the breech, with the apparatus connected therewith; and secondly, in the construction of cartridges for such fire-arms.

Claim first.—Mode of constructing the hinder ends of the barrels of fire-arms, in combination with the means of constructing and moving the breech.

Claim second.—Mode of constructing cartridges by inserting percussion powder at the back of the charge of common powder.

A lever is acted on by the trigger so as to move it up and down; this causes an equal parallel motion of the breech, which then moves backwards and forwards, or in and out of the barrel; a connecting rod joins the outside hammer to an internal hammer, to which a small crank is fixed; this being acted on causes the hammer to strike a needls, which passes forward through a hole made for the purpose into the cartridge case, and ignites the percussion by

the friction caused by the movement; this communicates to the other powder, and the discharge of the piece follows.

The cartridges are formed in cases which may be made of either wood or cardboard, at the bottom of which a sufficient quantity of percussion powder is deposited; this is covered by a piece of cloth, linen, or calico, to keep the powder in its place, when the remainder of the charge of common powder, with shot or ball, as the case may be, is added in the usual manner.

JAMES ALLISON, of Monkwearmouth, Durham, iron-founder, and ROGER LUMSDEN, of the same place, *inaprovements in the manufacture of iron knees for ships and vessels*, Nov. 30.—Claim.—The mode of forming iron knees for ships or vessels by means of rollers.

There being a pair of rollers provided (in the upper one of which a part is cut away) worked in the ordinary manner by cog wheels, and by any convenient power, the red hot iron is placed between them by inserting the thick end into the part cut away in the upper roller, and on their being turned the iron becomes elongated, and leaves the rollers in the form of a long piece, of equal width, but of a wedge shape on its edge; two of these are then welded at their thickest end, in the ordinary way to form the knees required.

WILLIAM HANNIS TAYLOR, of Norfolk-street, Strand, *certain inaprovements in the modes of forming or manufacturing staves, shingles, and laths, and the aaachinery used for that purpose*, Nov. 20.—Claim first.—Mode of steaming the wood into such a state of pliancy, that it may be easily cut into the required size and shape with greater expedition, regularity, and uniformity, than heretofore.

Claim second.—The four machines hereafter described, by means of which staves, shingles, and laths may be manufactured at less expense and with greater uniformity than by the ordinary methods.

A straight knife is firmly fixed to an iron plate, the ends of which slide up and down in grooves formed in the frame-work; a platform is fixed near the lower ends of the grooves, and on this the wood is placed when taken from the steaming trough, and pressed forward by hand as the knife rises, which every time it comes down cuts off a slice; these are conveyed away by an inclined plane, and then taken to the next apparatus. This consists of a table with a rectangular orifice cut through the top; a strong iron plate having an orifice to correspond is let into the table. On each side of this iron plate a curved knife is fixed, with their edges uppermost; a pyramidal block, having an opening cut in its centre, is also fixed on the table over the iron plate. One or more of the pieces from the first machine being placed in this opening will pass to the bottom and rest on the edges of the curved knives, when an appropriate stamper is pushed or pulled forcibly down, and all the staves in the opening will be cut to the same size, and pass through the opening in the table and fall on the floor. The next machine consists of a strong table on which a block is fixed; in the upper side of which block there is a concavity, or matrix, formed of the necessary shape to which the staves should be bent. A stamper with a face to correspond with the matrix is fixed to an ordinary screw-press, and on one or more of the staves being placed in the concavity, and the stamper brought down by the press, the requisite form or bend is given to the staves. The fourth machine is for the same purpose as the first, viz., for cutting slices of a proper thickness from a block of wood, which has been previously steamed for the purpose. This consists of a circular revolving plate with a projecting edge of the same depth as the required width of the stave; straight knives are fixed cross ways, or from the iron to the centre, and on the plate revolving the necessary operation is performed by the blocks being pushed across a platform towards the face of the plate, and therefore under the knives.

HENRY AUGUSTUS TAYLOR, of Milk-street, Cheapside, merchant, *improvements in the manufacture of braid and plats*, (being a communication), Nov. 28.—Claim first.—The guides.

Claim second.—The rollers.

Claim third.—The spring in the spool.

Claim fourth.—The combination of the above three claims with the braiding machine.

The inventor, after observing that the construction of these machines is too well understood to need description, proceeds to describe those parts invented by him in these improved machines.

The guides are on the ends of shafts, set in the circular pieces of the large circles, at the end of the serpertine sloat, and may be made plain discs, as is shown in the drawings, or as cylinders. On one end of the horizontal shaft there is a roller over which the thread passes, at the same time that it is passing underneath a second roller, by which second roller it is pressed and held. Each spool contains a spring for the purpose of preventing its unwinding too fast.

JOHN BAPTIST WICKS, of Leicester, *improvements in aachinery employed in frame-work knitting or stocking fabrics*, Nov. 30.—Claim.—Mode of applying needles to the needle bars of machinery employed in frame-work knitting and stocking fabrics, whereby they may be turned out of action by moving them on an axis.

There are two kinds of leads of needles, one kind so constructed as to be capable of being turned out of the way of the thread carrier; the other kind so constructed as not to turn, as is clearly shown in the drawings annexed to the specification. There are springs adjusted so as to act one on each lead of needles, in such a manner that while the needles remain in a horizontal position, the springs press on the back part of each neb, and when raised out of the horizontal position the springs press on the front part of each neb, but in either case they are sufficient to retain the leads of needles securely; so that when the workman wishes to commence narrowing his work he begins by tickling off the loops from the two outermost needles, which he then raises, first by lifting the levers, and then moving the needles out of the way of the thread carrier, in which position they are kept by their springs as above stated, and this operation is to be repeated at intervals, according to the degree of narrowness required.

JOHN HAWLEY, of Frith-street, Soho, *improvements in pianos and harps*, (being a communication), Dec. 1.—These improvements consist in the application of tempered steel strings to harps and pianos; they may be made either cylalindric or angular, and quite straight, excepting those for the deep notes, which are made thick in the middle and tapering off towards each end. They are formed by means of a wire-drawing iron, with an adjusting screw attached, so as to compress the wire, or admit of expansion. After the strings are formed they are made red hot, and then dipped in a mixture of the following proportions; tallow 5 lbs., beef-suet 6 lbs., bees-wax 1 lb., olive oil 5 lbs., powdered stag horn ¼ lb., mercury 32 grains, mixed together. From this mixture they will come out quite hard; they are then to be untempered to a certain degree (known by the changes of color) to admit of being straightened; and the ends are quite untempered that they may be wound round the screws without breaking.

Claim.—The application of the steel strings to harps and pianos as above stated, tempered in the manner described.

ENTERED AT THE ROLLS CHAPEL OFFICE.

(Continued from page 357.)

PIERRE DEFAURE DE MONTMIRAIL, of London-wall, *certain improvements in the manufacture of bread* (being a communication), Dec. 2.—Claim first.—The use of the liquid herein described.

Claim second.—The mixing the salt in a dry state with the flour, instead of in the water.

Claim third.—The apparatus described for kneading the dough.

The liquid claimed is made as follows; to eight quarts of boiling water add four ounces of gum arabic. When the gum is entirely dissolved, the liquid is run off and allowed to cool to a blood heat, when it is to be used in the same manner as pure water in the ordinary way of making dough. Instead of dissolving the salt in the water as is usual, the inventor of these improvements first dries it perfectly in an oven (taking care that it is not burned); it is then finely powdered, and in that state mixed with the dry flour.

The apparatus claimed consists of an ordinary closed boiler for heating the liquid, which when ready is run off through a cock into a cooler placed underneath. This cooler has also a cock through which the liquid runs, when it has cooled to a blood heat into the kneading trough, which is placed in a convenient position to receive the same.

FOREIGN PATENTS.—FRANCE.

(THIRD QUARTER OF 1839.)

By Royal Decree, dated December 18, 1839.

No. 1. Boileau, P. E., addition to patent for 15 years, dated Nov. 29, 1838, for *a new perpetual motion*, July 3, 1839.

2. Chesneaux, A. F., addition to patent for 10 years, dated June 15, 1839, for *improvements in railway wagons*, July 3, 1839.

3. Franc Bloque, J., 5 years, for *a composition for renderiag the hand white and soft*, July 3, 1839.

4. Lejars Chavanne, F. T., Pernot, A. J. H. E. A., 5 years, for *the foundations, composition, and laying down of new rails of vitrified substances*, July 3, 1839.

5. Perpigns, A., third addition to patent for 10 years, dated Oct. 28, 1837, for *a new permanent valve and piston fastening, for facilitating the introduction of gaseous liquids into vessels, for retaining them there, and for allowing them to escape*, July 3, 1839.

6. Saillard, A. V., 5 years, for *processes of manufacturing a bouillon de voyage*, July 3, 1839.

7. Serane, J. L., 5 years, for *a new process of making wire*, July 3, 1839.

8. Bellaton, Liandra, and Sslignat, 5 years, for *an imitation of figured lace*, July 8, 1839.

9. Boudet, F., third addition to patent for 15 years, dated Dec. 5, 1838, for *a chemical process of preparing skins to be tanned and tawed*, July 8, 1839.

10. Chavoutier, J. C., 10 years, for *various new heating apparatus, for producing a maximum of heat, for avoiding smoke, and for retaining the heat*, July 8, 1839.

11. Franchot, C. L. F., second addition to patent for 15 years, dated Dec. 27, 1838, for *an air engine for determining rapid changes of temperature, in a gaseous centre in closed vessels, and for transmitting externally the motive power produced*, July 8, 1839.

12. Leeellier Havard, J., 5 years, for *a new warming pan*, July 8, 1839.

13. Lheritier, S. D., and Dufresne, E., represented by Reynaud, 5 years, for *processes of purifying fish oils*, July 8, 1839.

14. Martin, R., 5 years, for *improvements in fire-arms*, July 8, 1839.

15. Vincent, J. H., 5 years, for *new apparatus for manufacturing hydrogen gas*, July 8, 1839.

16. Wayte, W., represented by Truffaut, 15 years, for *various improvements in steam-engines, in apparatas for generating steam, and in the means of heating and evaporating liquids*, July 8, 1839.

17. Whyte, J. C., represented by Truffaut, 10 years, for *various improvements in the construction of roads and pavements*, July 8, 1839.

18. Woodheat, J., represented by Truffaut, 10 years, for *means and processes of preventing the decay*

NEWSPAPER ADVOCATE INVENTORS

of certain animal and vegetable substances, July 8, 1839.

19. Balp, G., and Blaquière, A. F. H., 15 years, for *an apparatus for unravelling old tissues, and for rendering them fit to be manufactured*, July 10, 1839.

20. Chardigny, P. J., 5 years, for *new apparatus for lighting by gas*, July 10, 1839.

21. Dembinski, H., represented by Perpigna, 15 years, for *a process for preventing the breaking of champagne and other bottles containing fermenting liquors*, July 10, 1839.

22. Guyenot, C. L., 5 years, for *a compensating pendulum and an ancre in precious stones, glass, or cristal*, July 10, 1839.

23. Letievant, J., 5 years, for *a cylindrical chopper*, July 10, 1839.

24. Miel, J. A., 5 years, for *means of rendering jewels exposed to friction indestructible*, July 10, 1839.

25. Solcy, J., represented by Truffaut, 15 years, for *a machine for making nails of a heated sheet of forged iron*, July 10, 1839.

26. Wood, H. W., represented by J. Wood, 15 years, for *a new prompt economical method of making white-lead*, July 10, 1839.

27. Benou, C. L. H. and P. M. N., and Vergues, F., 15 years, for *a machine for fulling, cleansing, and washing woollen and other tissues*, July 17, 1839.

28. Boquillon, N., addition to patent for 15 years, dated June 20, 1839, for *apparatus for regulating the flow of liquids and of gas, for means of avoiding the dangers of compressing elastic fluids, as well as for a mode of compressing particularly applicable to lighting by gas*, July 17, 1839.

29. Fastier, L. A., 15 years, for *a new system of preserving nutritious substances*, July 17, 1839.

30. Geerts, E., 15 years, for *new moveable machinery for moulding bricks and tiles*, July 17, 1839.

31. Place, J. B. A., 5 years, for *a new system of covering roofs with zinc plates*, July 17, 1839.

32. Poole, M., represented by Truffaut, 10 years, for *improvements in steam-engines*, July 17, 1839.

33. Poole, M., represented by Truffaut, 10 years, for *improvements in machines for making cards for carding cotton, wool, and other fibrous substances*, July 17, 1839.

34. Poole, M., represented by Truffaut, addition to patent for 10 years, dated March 12, 1839, for *vessels for filtering liquids*, July 17, 1839.

35. Reallier Brépols de Saint Peray, and Desfossés, A., 15 years, for *a new process of drawing out glass*, July 17, 1839.

36. Seaward, S., represented by Bloqué, 10 years, for *improvements in maritime steam-engines*, July 17, 1839.

37. Benson, J., represented by Truffaut, 10 years, for *an improved method of condensing steam, and of conducting the water thus condensed into the boilers*, July 18, 1839.

38. Constant, Peugnot, and Co., 10 years, for *improvements in parts of spinning machinery*, July 18, 1839.

39. Craig, W., represented by Truffaut, 10 years, for *improvements in knitting frames, in which all fibrous substances may be used*, July 18, 1839.

40. Crompton, T. B., represented by Truffaut, addition to patent for 10 years, dated Sept. 5, 1838, for *a new process of manufacturing white-lead (carbonate of lead)*, July 18, 1839.

41. Paine, Elijah, represented by Perpigna, addition to patent for 15 years, dated Jan. 31, 1839, for *a galvanic motive power*, July 18, 1839.

42. De Fontenay, F. E., 10 years, for *a system of ventilation with cold and hot air, applicable to glass and pottery furnaces*, July 18, 1839.

43. Goldenberg, G., and Co., addition to patent for 10 years, dated May 27, 1839, for *improvements in rolled scythes*, July 18, 1839.

44. Parry, J. B., 15 years, for *a new mover worked by wind, applicable to vessels, mills, pumps, factories, &c.*, July 18, 1839.

45. Thibault and Son, and Perraud, 5 years, for *a mode of melting tallow without producing any disagreeable smell, residuum, or danger of fire*, July 18, 1839.

46. Charpentier, A., 15 years, for *drying and preserving vegetables and wood by means of ventilation with hot air, and aluminous and ferruginous solutions*, July 20, 1839.

47. Duchou, C., 5 years, for *a stove with gallery and reversed flame*, July 20, 1839.

48. Espie, P. J., addition to patent for 5 years, dated June 20, 1839, for *a medicament for the nervous affections of the air passages*, July 20, 1839.

49. Golay, sen. and jun., 10 years, for *a new truss*, July 20, 1839.

50. Kierzkowski, A. E., 5 years, for *an apparatus forming a dew bath*, July 20, 1839.

51. Maille, P. H., 15 years, for *a lime and brick oven*, July 20, 1839.

52. Maréchal, B., 10 years, for *a mechanical support and moveable axle-tree for carriages*, July 20, 1839.

53. Montanier, J. L., 5 years, for *an instrument for proving the strength of thread*, July 20, 1839.

54. Munier, H. J. B., 5 years, for *a composition for cleaning and polishing metals, and preserving them from oxydation*, July 20, 1839.

55. Munier, H. J. B., 5 years, for *a vegetable wax to be used instead of animal wax for polishing floors*, July 20, 1839.

56. Bagel Combes, A. F., addition to patent for 5 years, dated Dec. 27, 1837, for *an astral lamp*, July 25, 1839.

57. Bertrand, F., and Feydeau, A., 10 years, for *a new manufacture of tin or of tinned iron vessels for containing nutritious substances*, July 25, 1839.

58. Duvoir and Co., 10 years, for *a new heating apparatus*, July 25, 1839.

59. Fournel, J., represented by Perpigna, 5 years, for *an apparatus for preventing chimneys from smoking*, July 25, 1839.

60. Gary de Favier, F. T. C., 5 years, for *a new system applicable to railroads*, July 25, 1839.

61. Houdinet, P., 5 years, for *a system for preventing carriages from overturning*, July 25, 1839.

62. Jourdau, T. F., 5 years, for *a mode of preparation for preserving animal and vegetable substances in nature*, July 25, 1839.

63. Klein, N., addition to patent for 15 years, dated June 10, 1831, for *a new safety system applicable to equipages*, July 25, 1839.

64. Violette, 10 years, for *an instrument for ruling music, account books, &c.*, July 25, 1839.

65. Bournet, P. J. B. E., 5 years, for *a new lock*, July 31, 1839.

66. Deplege, L. A., represented by Perpigna, 5 years, for *applying bronze to varnished skin or leather*, July 31, 1839.

67. Gerard, J. F., 5 years, for *a new lock*, July 31, 1839.

68. Hoheberger, A., represented by Perpigna, 10 years, for *improvements in steam-boat towing*, July 31, 1839.

69. Montaudon, J. P., represented by Perpigna, 10 years, for *a machine for making rivets of wire*, July 31, 1839.

70. Newton, W., represented by Perpigna, 10 years, for *improvements in machines for combing hemp, flax, and other fibrous substances*, July 31, 1839.

71. Perilleux-Michelet, represented by Perpigna, 5 years, for *a new canvass for needle tapestry*, July 31, 1839.

72. Perry, J., and Co., represented by Perpigna, 15 years, for *improvements in inkstands, and in substances for sealing letters and other papers*, July 31, 1839.

73. Verneau, S. M. A., and Mouroy, C. A., addition to patent for 10 years, dated May 22, 1839, for *an apparatus for making sugar*, July 31, 1839.

74. Beslay, C. V., 15 years, for *a new steam boiler*, Aug. 10, 1839.

75. Casanova de Cyrnus, J. B., 5 years, for *a new watch without glass or hands*, Aug. 10, 1839.

76. Okey, C., represented by Digweed, 10 years, for *means of depriving beet-root sugar of its smell and bitter saline taste*, Aug. 10, 1839.

77. Pearson, F., represented by Reynaud, 10 years, for *improvements in stocking frames*, Aug. 10, 1839.

78. Perrot, L. J., 15 years, for *new machines for printing tissues, paper, oil, cloth, &c.*, Aug. 10, 1839.

79. Brunier, L., fourth addition to patent for 15 years, dated Nov. 25, 1837, for *a new system of producing a vacuum by a hydro or gaso-pneumatic apparatus*, Aug. 17, 1839.

80. Foussat, Brothers, represented by Armingaud, 10 years, for *a new machine for cleaning rice*, Aug 17, 1839.

81. Guérard, L. J. F., 10 years, for *a machine for embanking railroads, canals, &c.*, Aug. 17, 1839.

82. Marchal, 15 years, for *a machine for making horse-shoes*, Aug. 17, 1839.

83. Purée, H., and Duvergé, B. M. L., 5 years, for *the manufacture of mathematical instruments*, Aug. 17, 1839.

(To be Continued.)

FOREIGN INTELLIGENCE.

FRANCE.

FRAUDULENT ASSUMPTION OF THE NAMES OF FOREIGN INVENTIONS.

In the Royal Court of Paris on the 30th ult. the following important question to English manufacturers was brought forward, and decided in their favor:—

"Has the foreign manufacturer the right to cause the suppression of his name and signature assumed in France by a French manufacturer of a similar article, and placed on boxes, flagons, &c.?" In the course of the discussion some interesting details were submitted to the court as to the forgeries of patent medicines, and celebrated articles of the toilet, practised in France, Belgium, and England.

MM. Guelaud, Guesnot and Co., perfumers in Paris, appealed against a decision of the Tribunal of Commerce, by which they were ordered to pay the sum of 3,000 francs damages to Messrs. Rowland and Son, proprietors of "Macassar Oil," to which Lord Byron's allusion has given so much celebrity. The action had been instituted by the Sieur Bouveret, agent for its sale at Paris, in consequence of a counterfeited article with Rowland's name on the lable having been extensively sold. The same precise principle which was involved in the legal argument applies to every description of patent medicine in which England is so prolific, and of which the sale is daily increasing in the continental cities.

MM. Guelaud and Co., on an inquisition being made at their laboratory, produced a great number of vials, containing Macassar oil, which they did not deny to be of their own manufacture, and bear-

ing on the labels the name and address of "Rowland and Son;" but they alleged that this fabrication of a foreign production was perfectly legal in France. Rowland's agent thereupon abandoned the charge of forgery, and confined himself simply to reclaiming against the usurpation of his name, seal, and address.

The Chamber of Council pronounced that no action lay against the accused, and this ordinance was confirmed by a decree of the Chamber of Accusation. The same question having been reproduced shortly after in a trial relative to the fabrication of a Parisian imitation of some patent English needles, received the same solution by a decree of the same chamber. It would thus have appeared that according to the legislation of France, the facts with which the French perfumers were reproached by the London house could not be criminated. They were, however, subsequently summoned by Rowland's agent to appear before the Tribunal of Commerce, where damages to the amount of 10,000 francs were claimed. The tribunal in question decided in Rowland's favor, and condemned each of the five members of the Parisian firm of perfumers to the payment of 600 francs damages. The tribunal's decision contained the following words:—"The name of a man engaged in any particular trade often becomes a valuable property, which the laws of all countries ought to respect; to such a name a commercial value is often attached, which becomes a real family patrimony. The fabrication of Macassar oil is open to the public in France, but no one has a right to manufacture it under a name which does not belong to him; and the care which the defendants have taken to affix the plaintiff's name upon their vials, proves the plaintiff's interest in preserving the integrity of that name. Good faith and equity are of all countries, and the tribunals of France should not suffer the public to be deceived by speculations repugnant to both good faith and equity. If it be alleged that in similar matters Frenchmen trading in England are exposed to similar spoliations, these allegations are not justified; and, even if they were, it is not the less incumbent on the tribunal to do legal justice to foreigners placing themselves under the protection of the French laws, with a view to commanding and obtaining the same protection for Frenchmen abroad."

The Parisian perfumers sought to upset this.

It was contended in support of the appeal that the assumption of the names of French manufacturers was a fraud commonly practised in England, and therefore there could be no injustice in retaliating. It was contended that foreigners were not protected by the laws which acknowledged the sacredness of literary and *industriel* property in Frenchmen. Strangers in France were allowed to acquire civil rights; while piracy of every sort was permitted against Frenchmen in other countries. The counsel for the defendants said that, France exports annually perfumery to the amount of 6,000,000 f., and in London especially numerous compositions are sold as French which were never manufactured in France. The labels of French manufacturers are counterfeited in England, and affixed to bottles and boxes without the slightest scruple. Messrs. Shaw and Sons, engravers in London, offer (he alleged) in their catalogues to the public all sorts of labels, inscriptions, and emblazonments of this description, which may be purchased from them in thousands. There was a ludicrous instance of a mistake into which the English engraver fell. A Paris perfumer, named Lubin, was the inventor of an oil which possessed the property of fixing the hair on the head, and which he therefore called *fixateur des cheveux*, the English copyist wrote it *fixatur des chevaux*. (Much laughter.) The Belgians, who were perpetually assassinating French industry by their forgeries, were not more backward than the "English plunderers."

M. Paillet contended that there never was a more barefaced imitation, and that the proceedings of the French perfumers amounted to absolute brigandage. Rowland's name, seal, and signature, his treatise on the hair, his entire prospectus, were reproduced with the most minute accuracy. With regard to the alleged foreign piracies no proof had been adduced. In any case the example would be a shameful one, and it would be unworthy of them to follow it. Since England had been mentioned, he might observe that more generous ideas had there prevailed, and that, by a law of 1838, England proclaimed her respect for these principles, and enacted penalties for the preservation of literary property, to the benefit of which foreigners were entitled.

After a short deliberation the Court confirmed the decision in Messrs. Rowland's favor.

Previous to the public sitting of the Chamber of Deputies on Monday, Count Jaubert laid before the bureaux a very important proposition. "This," says the *Moniteur Parisien*, "contemplates the granting authority to government to indemnify the canal companies, and then farm out all these modes of conveyance at one equal tariff. In the last session, and before he entered into the Ministry, Count Jaubert explained his views on the subject. While he was in office he entered into communication with the canal companies, and succeeded in removing all the obstacles which were created by the various claims, and entered into provisional treaties, subject only to the sanction of the Chambers. The present Ministry not having come to any decision on the plan, Count Jaubert has taken upon himself to bring it forward. The bureaux have decided that it should be taken into consideration, and the Count will develop his plan at a public sitting."

The University of France has come into undisturbed possession of a legacy of nearly 100,000f. bequeathed by a lady named Guilbert, who died in 1828. The will had been disputed by the nearest relatives, and the case had been kept pending till a few days since, when the Cour Royale decided in favor of the University.

BELGIUM.

THE FELTED CLOTH PATENT IN BELGIUM.

The *Fanal* in a recent number gives the following extract from another paper published at Brussels, respecting the appropriation of the felted cloth patent by the Belgian government, to which it subjoins some pointed remarks on the unjust operation of the Belgian patent laws:—

"The *Observateur* contains a paragraph which it terms *extra-official*, and which we term "advico to patentees." The following is the fact, as it was communicated to that journal. 'A demand for a patent was presented to government, for the importation of a complete series of machines for manufacturing felted cloth. As the granting this demand would have given the inventor an exclusive right of property,—temporary property it is true, but which would have placed the manufacturers of this country at his discretion,—the administration thought it was well to take possession of it. M. Kindt was consequently sent to England to learn the method of manufacture. On his report the purchase of the machines was decided on, and a contract is concluded with the Phœnix Society at Ghent, where they will be exhibited as models to all the manufacturers in the country. By this new process a reduction is effected of half-price on the cloths of from 4f. to 15f., while the same qualities are preserved.'

"It is well to make the intelligence known to foreiguers as well as to natives who have any reliance on our patent laws. They will henceforth be aware of the danger they incur in communicating their plans to the 'Adviser' of government, who, whenever he finds the invention of any importance, will advise the minister not to grant a patent—but to take possession of it for the public benefit.

As it is the fate of inventors always to lose the advantage of their invention, perhaps they may as well be plundered by government as by any one else. Only it is useless to go to England for what was immediately athand. We have said that the inventor, Sebastian Botturi, is an inhabitant of Brussels; that his new machine is so simplified and improved that the English ought rather to send an agent to Brussels to learn these new improvements. Now M. Dowling has only been gone a few days, and the English machines arrived in Ghent cannot have received these improvements. The English machine costs, besides, 80,000 f., while the machine of the inventor does not cost 25,000f., and works much better.

The Brussels journals publish the text of the treaty of commerce and navigation concluded between Belgium and the United States of America, and signed at Washington on the 29th of March last, whereby it is declared that there shall be full and entire freedom of commerce between the two countries upon perfectly equal terms, the subjects of one country paying in the ports and towns of the other no greater duties, taxes, or impositions, than those which are levied and assessed upon the citizens, and shall enjoy in matters of commerce and industry all the same rights, privileges, and immunities. The treaty is to be in force for five years from the exchange of the ratifications. It is expressly stipulated by an additional article, that neither of the contracting parties shall impose on the merchandise or produce of the soil or industry of the other, imported into its territories, other or higher duties than upon similar articles coming from any other country. Each party is to stand to each other upon the same footing as the most favored nation.

In the Chamber of Representatives the laws relating to the importation and exportation of corn have been passed by a majority of 50 to 18.

The court of assizes at Brabant have sentenced M. Tack to six months' imprisonment, 2,000f. damages, and deprivation for ten years of his civil rights, for having calumniated M. Nothomb and the Society of Industry of St. Leonard. M. Tack had accused M. Nothomb of appropriating to his own use money paid for the construction of railways, at the time he had the direction of that branch of the administration.

The Belgian government has granted the sum of 30,000f. to each of the provinces of Flanders for the relief of the weavers and of the women employed in spinning. Besides the sum of 30,000f. granted to the provinces of Flanders, the government has granted 10,000f. for the improvement of looms and the purchase of improved instruments.

RAILWAY INTELLIGENCE.

DOMESTIC AND FOREIGN.

Railroad from Greenwich to Rochester.—The company of shareholders have purchased of the Thames and Medway proprietors, their canal. The rails for eight miles of the whole distance will, therefore, be laid down upon the land side of the canal. The bill, it is expected, will pass very early in the ensuing session.—*Kentish Observer.*

Great Western Railway.—We understand that one coach to Birmingham runs at present on this line, and that on the further opening four more are expected. The accommodation given to the intervening country causes this plan to pay.

London and Brighton Railway.—On Thursday last the ceremony of keying in the last arch of the "River Ouse Viaduct" was performed by E. J. Maudsley, the resident engineer, assisted by a number of gentlemen interested in the line. This viaduct, which is situated about two miles north-east of Cuckfield, crosses the extensive valley of the River Ouse nearly at right angles—it consists of 37 arches of 30 feet span, varying from 48 to 96 feet in height, and undoubtedly forms one of the stateliest structures to be met with either on this or any other railway.

The directors of the Manchester and Leeds Rail-

way Company had a plate-layer named Babbington, taken before a Halifax magistrate, lately, for neglect of duty. It appeared that the prisoner omitted to give the appointed signal to an engine-driver—rendered necessary by the recent raising of one of the rails—the consequence of which was, that the train was very nearly thrown off the line. It was proved that the man had been furnished with printed instructions as to his duty. The offence was laid under Lord Seymour's Act, and the directors having pressed for a severe punishment as a warning to other persons in their service, the prisoner, who did not deny the charge, *was sent to prison for two months.*

Committal of an Engine-Driver.—At Worship-street police office, on Thursday, Edward Hendley, an engine-driver in the employ of the Northern and Eastern Railway Company, who caused the accident on the 15th November, by running against a train, was finally examined. Mr. Duncan, the solicitor of the Eastern Counties Company, when the case was first brought forward, explained to the magistrate that between London and Essex there were three railway stations, the first at Shoreditch, the second at Devonshiro-street, Milc-end, and the other at Bow, and under their act of incorporation the Northern and Eastern Company had become tenants of the Eastern Counties Company for the use of so much of their railway as lay between Shoreditch and the junction of the two railways, and were bound to conform to the regulations agreed upon as to the mode of running the carriages, &c. It had been arranged, amongst other matters, that intervals of at least a quarter of au hour should take place iu the departure of trains, a regulation which was held to apply to return engines as well as trains, and that as to speed they should not in hazy weather go more than 15 miles an hour. To enforce these regulations a police inspector and some men were stationed at intervals throughout the line; and the defendant was charged with violating the directions given, and thereby causing great injury to the carriages of the Easteru Counties train and several passengers thercin. The collision happened on Sunday the 15th of November last, and the facts have been repeatedly before the public. The defendant was the driver of a return engine belonging to the North Eastern Counties Company, and he overtook a train belonging to the other compauy at Bow, and drove against it with great velocity, notwithstanding the warnings of the police to slacken his speed. Mr. Richards, a passenger in the last carriage, jumped out with a child in his arms, and saved himself from injury, except what he suffered by a fall; but the consequences to other persous were very severe. The magistrate, before whom the case was brought, said the Act of Parliament gave him power either to impose a fine of £10, or to commit for trial at the sessions. In this case he thought it right to adopt the latter course. The prisouer was, therefore, committed for trial. He was subsequently bailed.

The last link in the chain of railway communication betweeu the great sea-ports of Liverpool and Hull, will be completed on the 21st iust., by the openiug throughout of the Manchester and Leeds railway.

Railway Accommodation.—On Wednesday last about 20 passengers applied at the station-house, Glasgow, for first class tickets, which they obtained and paid for, but, on going to the train, all the first class seats were occupied, and the servants declined to attach another first class carriage to the train. The passengers, on threateuing to hire carriages on the road, were offered second class seats, with repayment of the difference. About 12 or 13, eager to get forward, accepted this offer, but seven of them declined, and hired two carriages to convey them to Paisley. On Thursday the account for the hire of one of the carriages was presented to the company, when the manager expressed regret at the circumstance, and ordered payment. The account for the hire of the second carriage has since been presented, and will doubtless be dealt with in a similar way. One of the seven passengers was for Johnstone, and the hire of a neddy from Paisley to that town was also presented, and was paid by the company.—*Paisley Advertiser.*

RAILWAY ACCIDENTS.

Railway Accident near Wakefield.—On Tuesday, an accident occurred at Goose Hill, on the line of the Manchester and Leeds Railway. The workmen who are finishing the contracts, had not connected the rails when they finished work for the day. The consequence was, the five o'clock train weut off on to the "rubbish line," and came in contact with the contractor's wagons, which of course sustained considerable damage, and this, with the consequent fright of the passengers, is, we believe, the extent of the mischief. The head servant of the contractor is in custody to answer the charge of neglect, in the room of the "ganger," who has absconded.—*Wakefield Journal.*

Collision on the Birmingham and Derby Railway.—On Wednesday week, a dreadful accident, attended with loss of life, occurred on the Birmingham and Derby Junction Railway. It appears that a passenger-train, consisting of three third class carriages in front, and the ordinary number of first and second class carriages in the rear, left the Birmingham station at half-past five on the above afternoon for Derby, and proceeded safely to and through Hampton; when, however, it arrived at a plain between Coleshill and Kingsbury, it came in contact with a truck, and the concussion was so great, that the engine was thrown off the rails, and on being released from the carriages it was impelled into a field, where it was stopped by a bank. Two of the third class carriages were forced off the line, and thrown over on their side, and one poor man was killed on the spot, and others severly injured. The stoker and fireman were thrown off the engine with great violence, and were much injured, some of their limbs being broken. A woman who was in one of the carriages was also bruised. The accident, it would seem, was occasioned by some unaccountable impropriety on the part of two men on the line. These men put a truck on the carriage line, and in trying to turn it round they had it completely aeross the rails when the train came up at its ordinary speed, and the guard and engineman being unable to see it, a dreadful collision took place, attended with the above unfortunate results. The name of the poor man who was killed is Black; he was a servant of the company, and was returning home by the train from a part of the line where he had been at work during the day. On the arrival of the intelligence in Birmingham, two gentlemen connected with the company were sent down, who, on examining the case, immediately caused the two men who were with the truck when the accident occurred to be apprehended. This is the first accident that has occurred on the Derby Junction line.

The inquest on the body of the man Black, who was killed by the collision and overturn of the carriages in the above accident on the Birmingham and Derby Railway, commenced on Friday and terminated on Saturday. The inquest was held at Nether Whitacre, near Coleshill. The Earl of Aylesford was present during the investigation.

The first wituess called was William Poulton, guard on the line, who deposed that he was with the down-train which left Birmingham at half-past five o'clock on Wednesday evening. They arrived at Coleshill station at twelve minutes past six o'clock, being five minutes behind time, and on reaching Orgrel's-end Bridge, near Whitacre, they came in contact, as he subsequently ascertained, with a small truck on the rails. The concussion detached the engine and tender, which went off the line of the railway, and two of the first carriages, which were of the third class, were turned over upon their sides. The remainder of the train consisted of second class carriages and one of the first class. These kept on the line, and ran on about 30 yards. The deceased, who was riding in one of the third class carriages, was pulled from under the engine quite dead. The stoker, whose name was Atkins, had one of his legs broken, but the engineer was not hurt. Another man, named Naylor, was much bruised, and was lying at a farmhouse in the neighborhood. It was moonlight. There was nothing in the way that they could see. The truck was used by the plate-layers, for the purpose of carrying materials along the liue.—By the Coroner.—If the men had been any way quick, they might have turned the truck over, and got it out of the way before the train arrived. It was usual to keep trucks on the rails for the purpose of repair, and when the train arrived to throw them off. But he did not see that there was any necessity for having a truck on the line at all at the time the accident occurred. The men were not required to work on the railway longer than daylight. He never saw any men at work on the line after dark before that night. Men were stationed along the liue at every part which was considered in any way to be dangerous.

George Somerville stated that he was engine-driver to the half-past 5 o'clock train from Birmingham. They arrived at Whitacre at the time stated by the last witness. He never recollected seeing a truck on the line after dark before that night. He did not see anybody with the truck, and indeed he never saw anything until he was in the ditch, where he met one man (whom he did not know), who confessed he was with the truck, but he (witness) had not time to question him further, as he had to look after his mate, the stoker, and he did not see the man afterwards. The engine and carriages were in excelleut working order, and when the accident occurred all was going on as well as they could go. Mr. John Stevenson was the contractor for the maintenance of the permanent way from Hampton to Tamworth, and Mr. Marson was employed under him to see the work kept in order. For that purpose he had gangs of men along the line under the orders of a superintendent. He (witness) had been employed on the Newcastle and Carlisle, and upon the London and Birmingham lines, and had been recommended by the manager of the last line to Mr. Burkinshaw, under whom he had been employed the last twelve months. He certainly considered the Derby line the safest he had ever been on. In the first place there were not many cuttings and embankments, and in the next place they had a good set of engines. As respected the watching and guarding, it was conducted like other lines. The present was the first accident which had occurred on the Derby line. At the time the accident occurred, the train was going at the rate of from 28 to 30 miles in the hour. The greatest speed at which he had ever gone might be from 42 to 44 miles in the hour.

Mr. John Burkinshaw deposed that he is resident engineer and manager of the Birmiugham and Derby railway. The truck which caused the accident had no right to be on the line, nor was there any necessity for it. The hours of the men were from six in the morning until six at night in summer, and during daylight in the winter, but they were often required to work during the night when there was any appearance of danger, arising from a slip, or other cause, on the line. No person had a right to use a truck on the line except for the company's work, and it ought not for any purposo to have been on the line at the time the accident occurred.

Mr Stevenson, the contractor, was examined at great length, with a view to corroborate the statements made by Mr. Burkinshaw and exonerate the company from all blame. It appeared that on Wednesday morning Mr. Stevenson directed Mr. Marson, who was in his employ, to send a letter for him to Tamworth, and that for the purpose of doing the journey quickly, Mr. Marson, without any order from Mr. Stevenson, sent two men in a truck with the letter in question. A great deal of evidence was then given, from which it appeared that Mr. Marson ordered the two men, named Barber and King, to take the truck to Tamworth, and that he accompanied them six miles on the road, when after giving them the letter to carry forward, he

left them directions to be very careful as to the trains. They remained at Tamworth a considerable time, and on their return they were warned by a policeman at Kingsbury, at 2½ miles from where the accident occurred, as to the probable arrival of the trains, when they replied to the effect that all was right, and were fully prepared to remove the truck upon the approach of danger. It so happened, however, according to their own statement, that when in the act of attempting to remove the truck the train came in upon them and the accident occurred, by which Black lost his life.

The jury then, after consideration, returned a verdict of *manslaughter* against Barber and King, the two men with the truck, and the coroner committed them to take their trial for that offence at the next assizes for the county of Warwick.

Mr. Carter, addressing Lord Aylesford, then said, that he was instructed, on the part of the railway directors, to state that they were determined to prosecute Mr. Marson under Lord Seymour's act, for negligently placing an obstruction on the trams of the railway.

Lord Aylesford said, that as a county magistrate, he was prepared to hear the charge.

The evidence, as it affected Mr. Marson, and already summarily stated, was then gone into, and at its conclusion Lord Aylesford said he felt bound to commit the prisoner to take his trial at Warwick. He accordingly committed him, but Mr. Marson subsequently procured bail to answer the indictment to be preferred against him, and he was discharged out of custody.

Two Guards on the Southampton Railway Convicted for Misconduct. — At Union Hall, on Monday, two men, named Bradford and Young, employed as guards on the Southampton Railroad, were charged with a breach of the regulations of the company. About a quarter to one o'clock on Monday morning one of the policemen belonging to the company saw four men walking along the railroad towards the terminus, and within about two hundred yards of the shed under which the carriages stop. He took them into custody. When brought before the magistrate, however, they were discharged, and one of them was called as a witness against the two defendants, Bradford and Young, both employed as guards in the company's service. John Trump, the witness, stated that he and three other men arrived by a train at the Andover-road station on the Southampton Railway at seven o'clock on Sunday evening. They were told that a train had just started, but that another one would be passing at half-past nine o'clock in which they could get to London. He and his companions were afterwards told that if they walked along the line, and held up their hats as a signal when they heard the train approach, the engine would be stopped and they would be taken up. Witness and the three other men then walked forward on the railroad, and passed through a tunnel 600 yards in length, and had scarcely time to get to the end of it when the train came up, and they having made the signal as desired, it was stopped, and they were ordered to jump in, which they did. The train then proceeded, and, when they got about half way to London, Bradford, the guard, demanded their fare, half-a-crown each, which they paid him, and when they arrived on this side of Battersea the engine was stopped, and they were told to alight and to walk along the road until they came to a spot which would lead them into the public road. They were also told, in the event of being stopped by any person while walking along the line, to say that they were employed as workmen by the contractors. Bradford, who was the head guard of the train, said that when going along it frequently happened that they stopped to take up the navigators at work on the line, and that, acting under the impression that witness and the other men were persons of that description, they were taken up on the London side of the Andover station. He denied that he told the men to walk along the line after they alighted from the train near Battersea. The magistrate inflicted a fine of £10 on Bradford, or two months' imprisonment, and a penalty of 40s. on Young. The secretary said that the company were most anxious to detect and punish with the utmost severity all those in their service who committed breaches of the orders, and that this was a case which called particularly for punishment.

THE CORONER'S INQUEST AT HARROW.

(*From the Railway Times.*)

The long-continued investigation before a Coroner's jury into the recent melancholy occurrence on the London and Birmingham Railway, has at length terminated in a verdict of murder and suicide against Simpson, the driver of the second engine, and a deodand of £2,000 upon the property of the company. With every disposition to respect the award of so ancient and so useful a tribunal, we must say that, in our opinion, a more monstrous verdict, so far as the company are concerned, has seldom been put on record. There is a ferocity about it which, to us, is altogether unaccountable, except on one of two suppositions—personal enmity to the company, or a desire to punish *some one*, as a probable means of quieting the alarm which the late accidents have produced. As we will not believe that any person sworn to discharge his duty impartially on so solemn an occasion could have suffered himself to be swayed by personal considerations, even supposing such to exist, we cannot help attributing the decision of the jury in the matter of the deodand, to a mistaken view of what they thought the public safety demanded at their hands. We are far from insinuating that they did not endeavor to perform their duty conscientiously; but the excitement which other occurrences of a similar character have unquestionably occasioned, gave, we think, a bias to their feelings, and interfered with that careful, candid, and thoroughly dispassionate consideration of the evidence—to the exclusion of all extraneous influences and impressions—which in an inquiry of another kind the gentlemen who composed the jury would doubtless have evinced. The wretched author of the calamity was beyond the reach of mortal censure, but the jury seem to have resolved that his misdeeds should not pass unpunished. The man Bradburn, it would appear from the concluding part of the verdict, had nearly fallen a victim to their resolute determination to hold *some one* responsible, but fortunately for him he escaped. In *his* case the hardship of the verdict would have been seen and acknowledged by every one;* in the case of the company, there are, unfortunately, too many who think that public bodies—more especially railway incorporations—can never be punished enough. If they do not deserve the infliction now, they will deserve it hereafter. Such is the reasoning of one class upon whose commendation the Harrow jury may count, while there are others who would wink at the perpetration of what they deem a slight injustice, in consideration of the great good which they fancy will result from it. These last are constantly calling for heavy deodands as a warning to other companies, and seem to care but little whether the punishment be at all proportioned to the offence, so that it be undeniably severe. They forget that unjust or inordinate inflictions, far from operating as a caution to the victim, or as a check upon others, arouse, at once, resentment and resistance. Deodands imposed in cases of clearly proved culpability, and proportioned to the extent of that culpability, would have, we doubt not, a beneficial influence upon railway bodies: but when, as in this case, they are imposed under pretences which will not stand the test of inquiry, and are moreover manifestly extravagant in amount, their effects cannot fail to be extensively prejudicial.

Do we then believe the management of the company to be wholly blameless in connection with this lamentable occurrence? By no means. It was a grievous error, and one which unhappily has been followed by very grievous results, to retain the man Simpson in their service after the *first* proof he gave of his unfitness for so responsible an office. He ought to have been dismissed instantly, if not more severely punished: and we trust that this case will read a lesson to other managements which will not soon be forgotten.

* We confess we dissent from this opinion; as he was acting contrary to the regulations to leave his engine when on the line of rails.—Ed. I. A.

THE SOUTHAMPTON RAILWAY MANAGEMENT.

Mr. Easthope's retirement from the Chairmanship of the Board of Directors on this railway, has been a subject of much comment. He held that appointment since the commencement of the undertaking, and it was supposed his resignation was attributable to differences with the other directors, respecting the management, which had been more aggravated since the recent fatal accident at the Nine Elms' station. The *Hampshire Independent* publishes the address of Mr. Easthope, on resigning, from which we extract the following:—

"Though for some time anxious to resign the chair on the first fitting opportunity, he had hoped to hold it until the completion of the whole line to Gosport, and until such a system of management should have been introduced into the locomotive department as might ensure a well-regulated system of economy, and establish in the mind of the public that feeling of security which was so essential to the prosperity of all undertakings of this nature. Such were the objects that he had intended to use his best efforts to accomplish, before he retired from the chair; and it was with no little pain that he felt himself compelled to anticipate the period fixed in his own mind, and to withdraw before the reforms and changes of management that he had contemplated, had been introduced. He did not, however, suppose that the step he had resolved to take would occasion his colleagues any surprise. No concern of the nature in which they were embarked could possibly go on prosperously, or in such a way as to command or merit the public patronage, unless there were a perfect harmony amongst those intrusted with its management, and unless the individual who held the chair knew that his colleagues in the direction would not desert him capriciously or upon light grounds. For a long time he had had the happiness of presiding over a united board, and could consequently act with the vigour and decision indispensable to the successful conduct of such difficult and complicated concerns; but for some months past he had perceived that the confidence of his colleagues was shaken, and latterly, for what reason he knew not, it would seem to have almost wholly disappeared. A deep sense of his responsibility to the proprietors might have induced him to overlook the uncourteous treatment he had received from certain of the company's officers, but the recent want of all efficient support from the court of directors, left him without an alternative. He had, of late, abstained as much as his situation would allow, from all interference in the management of the company's affairs, hoping that his colleagues would become sensible of the evils resulting from a feeble executive, and that they would themselves propose measures adequate to restore it to its former efficiency. In that hope, however, he had been disappointed. No corrective measures had been adopted, and the defective system of management which it had been his anxious wish to amend, had been allowed to continue, until calamitous results had followed. These circumstances, coupled with the recent fact of the appointment of an individual to the important office of secretary to the company, not only without any previous consultation with him, but in direct opposition to his decided opinion, left him no alternative but to resign, as he then did his office of chairman. Neither his responsibility to the proprietors and the public, nor his sense of what was due to his own character, would permit him any longer to retain a position in which his views were thwarted and his powers paralyzed. He could not allow himself to be held forth to the public as the principal party to a system of measures of which he disapproved, nor to be made accountable for errors he had unsuccessfully endeavoured to correct. In conclusion he stated, that though he thus took leave to resign his situation as chairman,

it was not his intention for the present to resign his office as director. To his seat in the direction he had been raised by the proprietors, and to them he should feel bound to account for his conduct before he quitted the position to which they had raised him."

REGULATIONS RESPECTING ENGINE DRIVERS.

We are glad to find that our recommendation of the appointment of a captain to the command of every railway train, seems to have met with general approval. The verdict of the jury on the Harrow inquest last week gave the sanction of their approbation to the plan; and the following article from the *Railway Times* also recommends its adoption:—

"Of the measures recommended for the immediate adoption of railway boards, the principal one is in effect, that they should pay their engine-drivers higher wages, so as to attract a superior class of men to the service. In connection with a well-arranged system of preliminary examinations, a higher scale of remuneration might be of use, especially if another suggestion which has been offered were carried into effect, namely, to appoint a "Captain" to each train, who should be responsible for its safe guidance. For the ordinary duty of a driver, constantly exposed not only to the "skiey influences," but to the action of the engine fire, it would probably be no easy task to find parties willing to discharge it at any price much above the class from which these persons are at present selected; and it may be a matter of great doubt as regards that class, whether a fixed rate of high wages—materially higher, we mean, than those at present paid by the principal companies—would tend to their improvement, unless accompanied with measures of a different description calculated to elevate their moral character. Artisans who are in the habit of earning much more than the average income of other trades, are not generally found to be the most attentive in the punctual discharge of their duties, and the majority of engine-drivers would, we fear, be more likely to be tempted into excess and its necessary consequences by extravagant wages, than be thereby induced to cultivate habits of sobriety, steadiness, and self-control, as the means of preserving them. But although a fixed scale of very high allowances may, under the circumstances, be open to serious objection, there can be but one opinion, we think, as to the propriety and policy of making good conduct and personal advantage go hand in hand. Let all drivers, found to be duly qualified, be *well* paid at a fixed sum, (for scanty wages are as much to be deprecated as extravagant wages), and let a further benefit accrue on every occasion of extraordinary merit. On the London and Birmingham line an excellent practice prevails, of apportioning a particular engine to each driver, for the proper care of which he is held personally responsible. By this means a man becomes familiar with the peculiarities of his machine, and takes a pride in keeping it if possible in better order than those of his companions, besides being aware that the effects of any want of attention on his own part will speedily be detected by his superiors and brought home to him alone. Might not the principle involved in this very salutary regulation be extended further? For instance, might it not be well to increase a driver's wages by a certain allowance proportioned to the saving he could effect per trip in the articles of coke, oil, &c., due regard being paid to the proper conduct of the company's business—or in proportion to the diminution of expenditure in the periodical repairs of his engine—or in respect of the punctuality of his arrival at the several stations, (neither before nor behind his appointed time, for the one is as bad as the other,)—or in numerous other ways which will readily suggest themselves to those practically acquainted with the details of railway working? The hint we think deserves serious consideration, for if the plan be capable of being reduced to practice, it will have a natural tendency to economise the resources of the companies, while it adds to the efficiency of their servants. In connection with a scheme of extra wages for extra work, there should be impressed upon the minds of the men a conviction that *certain and severe* punishment will follow every offence connected with the discharge of their respective duties."

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WE beg to recommend our AGENT for IRELAND, Mr. RICHARD TELFORD, 109, STEPHEN'S GREEN, DUBLIN, as the most eligible person whom PATENTEES can employ for the sale of their articles in Ireland. He has a most extensive and respectable connection, and his house is well known as a depôt for patent goods, inventions, &c. We have no doubt of his efficiency to promote the interest of those parties who may favor him with their business.

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A "CONSTANT READER" *will find we have availed ourselves of his communication.*

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THE

INVENTORS' ADVOCATE,

AND

JOURNAL OF INDUSTRY.

SATURDAY, DECEMBER 12, 1840.

*** *The Office for the publication of* THE INVENTORS' ADVOCATE, *is removed from Tavistock Street, Covent Garden, to the Patent Office, British and Foreign,* 198, *Strand; opposite St. Clement's Church.*

The tribunal of public opinion requires precedents, as much as the judicial bench, to guide its decisions. In the law courts, the dictum of some judge, who, more enlightened or more bold than his compeers, establishes a precedent, is blindly adhered to by others, perhaps as competent to form an *ab initio* opinion as their predecessor, but who gladly avail themselves of his decision as a shield against responsibility, and as a release from thought and trouble. It is so with the public, and to a much greater extent, for not having any specific statutes for guidance, the law of public opinion is more indeterminable, and the precedents take a wider and more varied range, than in the Courts of Westminster Hall.

It is on this principle that we can account for the increasing severity of coroner's juries, who represent a portion of public opinion, on the managers of railway companies. In the first instances, when these juries were summoned to inquire into the cause of death by railway accidents, they carried with them the old established precedent of inquests on the analogous cases of deaths by stage coach overturns. A verdict of "accidentally killed," with now and then a word of censure, or, perhaps, a deodand of a few pounds on the wheel, "the moving cause of death," was imposed. The extension and increasing traffic on railways was almost necessarily attended with an increased number of casualties, and the public mind having been roused, not so much, perhaps, by the actual calamity, as by the contemplation of the fearful consequences that might have ensued, the old precedent of stage-coach accidents was found to be not applicable to a conveyance in which the lives of hundreds were hazarded. The former deodands of five pounds were raised to five hundred, and the engine-drivers proved not so fortunate as the lucky coachmen, to whom "no blame" was ever attributable. Still, however, they escaped tolerably well; considering, too, in more than one instance, the gross carelessness they exhibited.

A precedent having thus been established that railway accidents must be dealt with more severely than stage coach overturns, in consequence of the magnitude of the interests involved; the public,

taking up the question in a state of alarm, excited by the enemies of railway conveyance, were ready to improve on the precedent with rigorous exactitude. In this state of the public mind the inquest at Harrow was held before a coroner who was evidently well prepared to go along with the tide of popular excitement. We do not blame him for this sentiment. It was his duty to examine all the causes of the accident, and if blame existed, as there could be no doubt there did somewhere, to endeavor to detect to which party it attached; but it was likewise his duty not to exaggerate the nature of the offence. In his exposition of the law he quoted many cases of death from inadvertence, or wanton carelessness, which had been held to be murder in law; and the verdict of the jury would of course be materially guided by such cases. We much question, however, whether in any one of the instances he cited, a modern jury would on trial find a man guilty of murder; and it is holding the sword of justice with too firm a grasp to punish even railroad offenders by the rules of an obsolete and sanguinary law, which modern practice condemns. The verdict of wilful murder and *felo-de-se*, being, however, inoperative by the death of the offender, it is a harmless cautionary signal to all other engine-drivers of the present course of public opinion, and in so far it may do much good.

The other part of the verdict, awarding £2,000 against a board of directors who have conducted the business on their important line of road with fewer accidents and with more precautions for safety than any other, is making a long step in advance of any former precedent, and in a case also in which such extra severity seems especially undeserved. When this deodand is compared with others, not long since awarded, in cases where great culpable negligence was proved, the inequality of punishment deprives the award of the color of justice, and causes it to assume the appearance of enmity. Either the juries in the former instances were most weakly and blameably lenient, or the Harrow jury have far exceeded what the justice of that case required. We regret that they should have been so far unjust, for the effect of such a verdict will have a contrary tendency to what is intended. If a system of persecution be adopted towards the railway companies, it will awaken a sympathy in their behalf; for the English people, though liable to be misled for a time, will, after a short consideration, return to the side of reason and justice. That the railway directors are blameable for not taking more precautions against accidents, especially in the appointment of the men who have the management of the trains and signals, we have again and again remarked in terms of censure. We have not been slow to condemn the lethargy evinced when any mode is suggested by which the occurrence of accidents might be prevented; but at the same time allowance should be made for acts of commission and omission in the management of a mode of conveyance which is so entirely new, and at present but experimental. When, as in the case of the London and Birmingham railway, thousands upon thousands of miles have been travelled without serious injury to any passengers, such an unprecedented attainment of security is deserving of especial praise, instead of being selected, on the first occurrence of collision, as an object for especial punishment.

The coroner's jury at the inquest on the man killed on the Birmingham and Derby railway have come to an important and operative decision, which will, we trust, have a very beneficial effect. Without being more severe than the case seemed to warrant, it will serve as a warning to all men engaged on the lines of railway, that not only must they take heed to get out of the way of a train for their own personal safety, but to guard against future punishment by the law. The punishments at present awarded for all acts of culpable negligence that endanger the lives of passengers, but are, by some lucky chance, not attended with accident, is not nearly adequate to operate as cautions on the majority of such men as are employed on railways. When, however, it is clearly perceived that their conduct, in case of accident, will be rigidly inquired into, and, if culpable, severely punished, we may hope that a few severe examples of the consequences of carelessness or neglect, will be effectual in diminishing the frequency of accidents on railways, which we have lately had to lament.

NEW INVENTIONS.

INK PREPARED WITH PRUSSIAN BLUE.

This substance, so beautiful in color, which now rivals indigo, since it is used for dying silk and woollen, has not hitherto a proper solvent. The solvent employed is a vegetable acid, possessing a powerful discoloring property,—oxalic acid, which is the agent which effects the solution. In order to prepare this ink, which is capable of taking the greatest variety of shades, from the deepest blue-black to the lightest cerulean blue, it is necessary to pound with care the coloring matter with a sixth part of crystallised oxalic acid mixed with a little water, so as to form it into a very fine mixture; then to dilute it with rain water, slightly gummed. The quantity of water added should be larger or smaller according to the shade required. When the solution is in the least degree concentrated the ink is of an extremely deep blue. Unfortunately this ink is not secure from the action of different chemical agents, such as pearl-ashes, &c. The inventors, MM. Stehn and Nash have, notwithstanding, taken out a patent for it.

NEW WOOD PAVING AT VALENCIENNES.

A trial has been made on the platform in front of the town-hall at Valenciennes, of a method of substituting for the sheet lead, which covers that platform, pieces of wood impregnated with bitumen, and covered with a coating of metallic paint capable of resisting the wet. The inventors think that this kind of paving, made of small cubes of wood fixed close together in a right line, will offer more effectual resistance than the sheet lead, which is easily cracked by heat, and which, when soldered, leaves projecting pieces of solder, very disagreeable to walk upon.

IMPROVED INVALID'S BED.

The Committee of the Society of Arts also reported at their last meeting on the following newly-invented bed for invalids, by Mr. R. F. King, surgeon, of Whitehaven. This improvement consists in the addition of a second motion, on the late Mr. Earl's "fracture bed" used in the Bartholomew and other hospitals. In cases of fractures of the bones, it is absolutely necessary that they be kept constantly in one position, in order that the parts may unite. The body of the patient may be fixed in the required position by Mr. Earle's apparatus. The constant pressure, however, on the same parts of the body, attending its unchanged position, frequently produces sloughing, and other disastrous consequences. Mr. King's principal object in this contrivance is that of effecting (by a gentle motion communicated to the bed by means of an axle and strap) a change of position of the whole body while the relative position of its parts remains unaltered, in order that the pressure of gravitation may be transferred to various parts of the body, and that the general health of the patient may be preserved.

IMPROVEMENT IN THE MANUFACTURE OF SADDLES.

At the last meeting of the Society of Arts, the committee of mechanics reported, among other inventions, the following, for the improvement of saddles, by Mr. C. Candland, of Brownlow-street.

The improvement is applicable to the harness-saddle of two-wheeled carriages. It frequently happens that the back-band (which passes over the flap and through an opening between the tree and the skirt) is jerked upwards by the action of the shafts, and rips open the stitches where the skirt is sewed to the flap.

As a remedy for this evil, Mr. Candland inserts in the flap, under the skirt, a staple of sufficient width for the back-band to pass through it. The head of the staple is let into the under-leather of the skirt. The staple is secured by nuts on its screwed points, which terminate in the pad, by the thickness of which they are effectually prevented from galling the horse. Between the nuts and the under side of the flap is a small iron bearing-plate, one end of which passes under the tree. By this arrangement, the strain which the skirt would otherwise suffer is received by the staple and flap.

NEW RAILWAY.

We have seen a model of a railway on an entirely new construction, which does not require the use of locomotive engines. As the foreign patent is unsecured, we are not at liberty to explain its bearings and action, but we believe it will be found to be more simple and less expensive than the atmospheric railway, with all its advantages, and preferable to the rope used on the Blackwall Railway.—*Courier.*

THE DEVELOPMENT OF ELECTRICITY FROM HIGH PRESSURE STEAM.

The Brussels paper, the *Fanal*, alluding to the recently announced discovery that electricity is developed by the escape of steam from the boilers of steam engines, puts in the following claim to the discovery on behalf of a Belgian engineer:—"This discovery, which was accidentally made by our neighbors across the water, is not new to us. Some time ago M. Désiré Tassin, one of our most experienced mechanical engineers, had been induced, not from a single observation, but in consequence of profound study on the causes of explosion in steam-engines, to form a decided opinion on this subject; he has on many occasions declared it and supported it by reasons and facts equal to demonstration.

"It may be remembered, that in the month of November 1839, the boiler of a steam-engine, placed in a distillery at Vieux-Walesse, in the canton of Hay, a province of Liege, exploded and caused great disaster. M. D. Tassin went to Vieux-Walesse at the time of the accident. He was desirous, by an investigation made on the spot, to add the weight of additional experience to the scientific induction which had long ago led him to consider electricity, if not as the only, at least as the principal agent of explosion in steam-engine boilers.

"M. Tassin, on his return from Vieux-Walesse, formally declared that he could only attribute the cause of this explosion to electricity, and that in his opinion it was physically impossible that it could have been occasioned by the pressure of the steam. In support of this opinion he stated the facts that he had proved during the course of his professional career, and the particulars he had collected at Vieux-Walesse with respect to that case,

and among others one which appeared as being very singular, viz. that five minutes before the explosion the manometer only indicated three atmospheres of pressure in the boiler. The safety-valve also acted in the usual manner. This engineer afterwards judiciously observed, that the accumulation of electric fluid in the boiler, and particularly in those of locomotive engines, was unavoidable; that it must be the necessary consequence of the manner in which they are constructed; and he mentioned other circumstances which, with the former one, concur in calling into action the terrible power of electricity in these engines.

"M. Tassin was not satisfied by merely investigating the source of the evil, he at the same time endeavoured to discover an effectual means of remedying it. He described a piece of mechanism he had invented, for the purpose of preventing electrical explosions. To attempt to explain its nature and action would be to encroach on the privilege of this engineer. It is sufficient to mention that the accidental discovery of which the English journals boast, had been previously made by an engineer of Belgium in the course of studies and investigations directed to this subject. More explicit details belong to M. Tassin, and the general interest which the subject excites will doubtless induce him to publish them, when his opinion, or to speak more accurately his discovery, has acquired the authenticity that so important a subject requires before being produced in public."

THE ELECTRICITY OF EFFLUENT STEAM.

In the last number of the *Philosophical Magazine* there are several communications relative to the electricity developed by high pressure steam on escaping. In one of these communications, from Mr. Armstrong, he gives the following particulars of the results of some experiments made with steam issuing from a locomotive engine on the Newcastle and North Shields railway:—

"Nearly all the experiments were made at night, under cover of the engine-shed, and the atmosphere was generally humid; but when it happened to be otherwise, the quantity of electricity derived from the jet was greatly increased.

"Upon trying the steam in the first instance by the method adopted in the previous cases, that is to say, by standing on an insulated stool and holding with one hand a light iron rod immediately above the safety-valve, while the steam was freely escaping, and then advancing the other hand towards any conducting body, sparks of about an inch in length were obtained: but it was soon observed, that by elevating the rod in the steam the electricity was gradually increased, and that the maximum effect was not attained until the end of the rod was raised five or six feet above the valve, at which point the length of the sparks occasionally reached two inches. Small sparks were even obtained when the rod was wholly removed from the steam and held in the atmosphere at the distance of two or three feet from the jet, and the electricity thus drawn from the air was positive, like that of the steam. When the rod was extended into the cloud of vapour which accumulated in the upper part of the shed, electricity was drawn down as by a lightning-conductor from a thunder-cloud. I endeavoured to ascertain whether any precipitation of moisture, analogous to the formation of rain, accompanied the abstraction of electricity from the steam, and a sprinkling of wet was undoubtedly felt on the face and hands by the person holding the rod, so long as he remained insulated, but the effect ceased as soon as the insulation was destroyed.

"After fully trying the steam with a simple iron rod, as a conductor, recourse was had to other conductors which presented a larger surface to the steam, but the effect was not materially increased until a bunch of pointed wires of different lengths was attached to an iron rod and held in the issuing steam, with the points presented downwards. The iron rod terminated in a round knob at the end next the hand, and from this knob sparks of the *measured length of four inches* were actually drawn, almost as rapidly as they could be counted, while a stream of electricity was at the same time passing off from the rod, at the part which most nearly approached the chimney of the engine. Very perceptible sparks were also obtained when the points were held in a clear atmosphere, at the distance of at least eight feet from the nearest part of the jet.

"In all the preceding experiments, the effect appeared to be proportionate to the quantity of steam discharged from the valve, when other things remained the same; and the electricity became quite imperceptible when the escape was very inconsiderable.

"By abruptly raising the valve when the engine-shed was dark, the edges of the lever and margin of the brass cup which surrounded the valve, were rendered distinctly luminous with rays of positive electricity, which were strongest the instant the valve was lifted, and then quickly subsided, becoming very faint after the lapse of a second."

Mr. Pattinson also furnishes an account of several experiments he performed on steam issuing from locomotive boilers, of which the following are the most striking:—

"1. A copper rod, half an inch in diameter, and five feet long, was provided, made hollow for lightness; this was terminated at one end by a two-inch ball, and at the other (which was bent at a right angle) by ten or twelve sharp-pointed wires, spread out in every direction to collect the electricity more perfectly from the steam.

"2. The Wellington locomotive engine, immediately after coming to the station with passengers, was first tried. At this time the steam was blowing forcibly out of the safety-valve, at a pressure of fifty-two pounds per inch. On holding the pointed conductor in this current of steam, with its points downwards, the individual holding it standing at the time on an insulated stool, sparks three to four inches long were given off from his person to the boiler. The sparks were largest when the valve was held down a minute or two and then suddenly lifted, so as to suffer a large volume of steam to escape with great rapidity. By this management the sparks were frequently four inches long, and occasioned considerable pain to the person on the stool, even when given from a brass ball held in his hand. The sparks were largest when the points of the conductor were held in the steam about two feet above the valve; but larger sparks were obtained when it was held much higher; and indeed sparks were obtained by holding the conductor entirely out of the cloud of steam, and at a distance from it, for the air in the wooden shed in which we operated became speedily electrical throughout. The electricity was positive.

"3. The steam in the boiler was now gradually run down to see how the electrical condition would vary with the pressure. At forty pounds per inch the sparks became much less, the largest not reaching three inches. At thirty pounds the largest spark did not reach two inches; at twenty pounds it became barely an inch; at ten pounds not more than from one-fourth to one-half of an inch; and at five pounds per inch pressure the spark was hardly perceptible. But if at any pressure the valve was held down a few minutes so as to suffer the steam to accumulate, and then suddenly opened, there was always a great increase for an instant of the electrical effects.

"4. Another boiler, that of the Lightning engine, which had also just come in from a trip, and had its steam blowing off forcibly, at a pressure of fifty pounds per inch, was now tried in exactly the same way as the Wellington. On holding the pointed conductor in the steam, whether regularly blowing off at the valve or escaping with great rapidity from the sudden lifting of the valve, it did not yield a spark more than one-fourth of an inch long. We then blew a quantity of water out of the boiler of the Lightning until it barely covered the tubes inside, and on afterwards testing, its steam blowing off at fifty pounds per inch, the spark was found increased to nearly two inches in length. The steam of the Lightning was, however, much less electrical than the steam of the Wellington at the same pressure, under all the circumstances of our experiments.

"5. The strong current of steam and water issuing from the boiler of the Lightning when the water was blown out of it as just stated, was tested for electricity, but no indications could be perceived whatever.

"6. A very large conductor had been provided, made of zinc two-inch tubing, in this way,—three rings were made of this tubing, respectively three feet, two feet, and one foot diameter. These rings were attached to each other a foot and a half apart by side pieces, so as to form a hollow frustrum of a cone, three feet high, with ends three feet and one foot diameter respectively. The inside of this cone was laced across with copper wire, and the whole bristled with pointed wires in every direction. By means of a long iron bar, placed upright in a cask of rosin (both to insulate it and to serve as a foot), and a horizontal arm projecting from it, made to slide up and down on the vertical bar, the large conductor could be placed in any part of the cloud of steam issuing from the valve, and the electricity given off could be conveyed from it in any direction. Care was taken to round off all parts of this conductor, so as to avoid sharp points and angles as much as possible. On trying this large conductor in the current of steam from the Wellington, we were disappointed to find that it did not yield a longer spark than the small pointed copper rod with which we had previously experimented. The spark was larger in volume, but it did not possess greater intensity. It never struck through more than three inches of space, but its effect upon the person when taken was very violent and painful. Our intention was to have ascertained the rate at which large jars could be charged from the steam, in order to form some idea of the quantity of electricity given off; but the evening had become very damp, and the air was so moist, that we could not procure sufficient insulation, and were obliged to relinquish the attempt.

"7. When the large conductor was held in the cloud of steam with its lower part or apex about two feet above the valve, it gave off numerous and powerful sparks; but if at this time the points of the small conductor were placed by a person connected with the ground in the steam below the large conductor a foot above the valve, the electricity given off by the large conductor was very materially diminished.

"8. By means of screws, the entire engine (the Wellington) was raised off the rails and placed upon blocks of baked wood, so as to insulate it entirely. The steam being now blown off at the valve, the boiler and engine became strongly electrical with negative electricity; points placed upon any part of the engine exhibiting the peculiar star of the negative element, and threads suspended from the engine being repelled by excited sealing-wax. The steam was at the same time strongly positive, and when a point connected with the conductor held in the steam was brought near a point attached to the insulated boiler, the pencil upon the former and star upon the latter were beautifully decisive as to the electrical states of each.

"9. I repeated Volta's experiment by placing a hot cinder upon the cap of a gold-leaf electrometer, and projecting a few drops of water upon it, when the leaves diverged strongly with negative electricity. I observed, that when the cinder was very hot, and the production of the steam consequently very rapid, the electricity given out was always most powerful.

"10. I then insulated an iron pan, twelve inches diameter and two inches deep, and attached to it a pith-ball electrometer, with balls three-eighths of an inch diameter, and threads five inches long, and also attached to the pan a metallic wire, the pointed extremity of which was placed about one-twentieth of an inch distant from the point of another wire connected with the ground. The iron pan was then filled with cinders, very hot, from a wind-furnace, and on projecting upon them a few ounces of water,

steam was evolved with great rapidity, and at the same moment the pith balls diverged to the distance of an inch, and sparks passed between the metallic wires. This was several times repeated."

ORIGINAL REPORTS OF SCIENTIFIC MEETINGS.

(Contributed expressly to the Inventors' Advocate.)

MEETINGS OF THE SCIENTIFIC BODIES OF LONDON,—FOR THE WEEK COMMENCING DECEMBER 14, 1840.

Monday.	Geographical Society	8	P.M.
	Medical Society	8	P.M.
Tuesday.	Linnæan Society	8	P.M.
	Architectural Society	8	P.M.
Wednesday.	Society of Arts	7½	P.M.
	Geological Society	8½	P.M.
Thursday.	Royal Society	8½	P.M.
	Society of Antiquaries	8	P.M.
Friday.	Botanical Society	8	P.M.
Saturday.	Westminster Medical Society	8	P.M.
	Mathematical Society	8	P.M.

ROYAL SOCIETY.

The following distribution took place at the Anniversary Meeting, on Monday, November 30, with respect to the awards of the medals, viz.—One of the Royal medals was awarded to Sir John F. W. Herschel, Bart., V.P.R.S., for his paper, entitled, "On the Chemical Action of Rays of the Solar Spectrum on Preparations of Silver and other substances, both metallic and non-metallic, and on some Photogenic Processes,' published in the Phil. Trans. for 1840. The other Royal medal was awarded to Charles Wheatstone, Esq., F.R.S., for his paper, entitled, 'Contributions to the Physiology of Vision,' published in the Phil. Trans. for 1838. The Rumford medal was awarded to M. Biot, of Paris, For. Mem. R.S., for his researches in and connected with the Circular Polarization of Light. The Copley medal for the present year was awarded to Prof. Liebig, For. Mem. R.S., for his discoveries in Organic Chemistry, and particularly for his development of the composition and theory of organic radicles. Another Copley medal was awarded to M. Sturm, of Paris, For. Mem. R.S., for his "Mémoire sur la Résolution des Equations Numériques," published in the Memoires des Savans Etrangers for 1835.

New Council for 1840 and 1841:

President.—The Marquis of Northampton. *V.P.* and *Treasurer*—Sir John William Lubbock, Bart., M.A. *Secretaries*—Peter Mark Roget, M.D.; Samuel Hunter Christie, Esq., M.A. *Foreign Secretary*—John Frederick Daniell, Esq. *Other Members of the Council—George Biddell Airy, Esq., M.A., A.R.*; Sir John Barrow, Bart., V.P.; Thomas Bell, Esq.; *William Thomas Brande, Esq.; Richard Bright, M.D; Sir Benjamin Brodie, Bart.; The Earl of Burlington, V.P.*; Bryan Donkin, Esq.; *William Henry Fitton, M.D.*; Edward Forster, Esq.; *The Very Rev. George Peacock, D.D., V.P.*; Richard Phillips, Esq.; *The Rev. Baden Powell*; Major Edward Sabine, R.A., V.P.; *Lieut.-Col. William H. Sykes; Rev. Robert Willis, M.A.*

The Fellows whose names are printed in *Italics*, were not Members of the last Council.

SOCIETY OF ARTS.

Dec. 2. J. Ashton Yates, Esq., M. P., V.P., in the chair.

The Society adopted the recommendation of the committee of chairmen, to omit the business meeting of the second Wednesday in each month, for the purpose of appropriating that day for the "illustration." The principal object of this alteration is to afford an opportunity of attending the lecture to those members who are also members of the Institution of Civil Engineers, and other scientific societies who hold their meetings on Tuesday.

The report of the committee of mechanics was read, and among other inventions noticed were "an improvement in the manufacture of saddles," by Mr. C. Candland, 17, Brownlow-street, Drury-lane; and a bed for invalids, invented by Mr. R. F. King, surgeon, of Whitehaven, both of which are described under the head of "New Inventions," in the present number of our journal.

Mr. Jones submitted to the inspection of the committee a key for the extraction of teeth, the shield of which was covered with caoutchouc, to be used in the place of lint.

The Secretary read a letter from his Excellency Sir J. E. Murray M'Gregor, Governor of Barbadoes, and stating that the premiums offered by the Society in the "class of Colonies and Trade," had been published by his order in the Government Official Gazette of Barbadoes, and had been forwarded to the officers administering the Governments of St. Vincent and Trinidad. The letter was accompanied by a copy of the Gazette, containing the list of premiums, prefaced by the Secretary's letter to his Excellency.

It was resolved that an address be presented to Her Majesty, on the occasion of the birth of the Princess Royal, and that a similar address be presented to Prince Albert.

ENTOMOLOGICAL SOCIETY.

Dec. 7. Rev. F. W. Hope, F.R.S., President, in the Chair.

A communication was made to the society, by Dr. Calvert, on a species of caterpillar which had proved very injurious to corn during the past year; specimens of which were on the table. The subject led to much discussion.

A paper was then read by Mr. R. H. Schomburgh on the migration of butterflies (*Papilio*), in British Guiana.—Mr. S. detailed some curious facts relative to the great number of butterflies (of which he could distinguish three kinds) he had observed during his travels in British Guiana, at certain seasons. On one occasion when ascending the river Berbice, a flight of butterflies crossed the river from the plains, and all taking one course, viz. from the south-west to the north-east. From computations he then made, he is convinced that in 9½ hours no less than 17,100 butterflies must have passed over a single spot, and that at least fifty-three hundreds of millions must have passed over him during his day's journey. The caterpillars of these insects likewise abound in the proper season, and create great devastation to the herbage on which they feed. The tawny natives mix the caterpillars with flour, and make an excellent bread, some of which Mr. S. has eaten; they likewise eat them mixed with the eggs of the turtle.

The president then made some observations on the subject, and stated that migrations of a similar character had been noticed by Sir R. K. Porter, in South America, and Dr. Horsfield, in India. They have also been observed in Switzerland, and Mr. Westwood has witnessed a similar fact in England, after damp rainy weather. Mr. Gould, who has recently returned from Australia, stated that he had seen a small caterpillar in that country in great numbers, covering a space of a mile and a half in extent—they always follow a fertile season, and especially after rain, when they devour every herb within their reach, such as tobacco, and even the vineyards are sometimes damaged by them. They are preyed upon by hawks, Mr. Gould having seen 500 on a plain at one time feeding off them. He has eaten those obtained from the gum trees when roasted, and states them to be good eating—they are partaken of by the natives.

A communication was read from the secretary, Mr. J. O. Westwood, on some new species of *Hymenoptera* from India, from the collection of Mr. Saunders, including some new genera.

Mr. Schomburgh presented the society with a new locust, collected in British Guiana.

[It is a curious fact that on those parts of the coast of America, which are particularly liable to the yellow fever, the approach of the disease is frequently announced by immense flights of moths or butterflies. A gentleman who was at Jamaica a few days before the time when the yellow fever usually showed itself, stated to us that the whole air seemed thronged, and actually darkened by those moths. He described the appearance of the atmosphere when looking upwards, to resemble that produced by a heavy fall of snow. In three days afterwards the yellow fever was ravaging the place. —*Ed. I. A.*]

BOTANICAL SOCIETY OF LONDON.

Dec. 4. John Reynolds, Esq., Treasurer, in the Chair.

Specimens of *Tortula enervis* were presented from Mr. Robert Starke, collected in Mid Lothian and East Lothian. A Moss, new to the British Flora, was exhibited by the secretary, received from Mr. R. B. Bowman. Mr. R. H. Schomburgh presented the society with a seed (the first that has been brought to this country) of the *Victoria regia*, of which he is the discoverer, in British Guiana. A paper was read by Mr. Daniel Cooper, the Curator, "On Vegetable Wax," being Part I. of a paper to be read before the society. The few notices of the plants which yield this substance scattered through the works of recent and old authors, would lead the inquirer naturally to infer that little is known of the vegetables which produce it—an article allied as to properties and general characters to that obtained and deposited by the bee. The most commonly met with forms of vegetable wax will at once be recognised even as to structure, appearance, and functions it performs, as being similar, if not altogether identical, to that obtained from insect architecture, honeycomb. Those who are familiar with the *bloom*, as it is termed, on fruit, flowers and leaves, cannot but be struck with the occurrence of this delicate and finely-covered coating of vegetable wax (usually, however, by the ignorant, erroneously asserted to be of insect origin); especially, when in addition to its characteristic beauty, as indicative of the maturity of the fruit, it performs the important function of repelling water in any shape whatever, whether in the fluid, or held in the atmosphere as aqueous vapour, or condensed in the form of dew. The reason is sufficiently obvious, and capable of explanation on sound physiological principles. It is a well-ascertained fact, as first proved by Dutrochet, that when two fluids of unequal densities are separated from each other by a membrane either of animal or vegetable composition, the denser fluid has the power of absorbing the less dense fluid, through that membrane; and when this takes place it constitutes the law, established by that renowned physiologist, called *Endosmose*. In the plum and other fleshy fruits, possessing this *bloom*, were it not for this provision, they would be subject to the external influence of atmospheric vicissitudes, and would, in rainy and damp seasons, become so gorged with water, applied in the form of rain, dew, &c., as to cause the fruit to burst. This is a common fact known to all who have witnessed the effects of a very heavy fall of rain on exposed fruit (such, for instance, as the insipid and gorged state of strawberries after the rain). The longitudinal fissures in the skin of plums, &c., after rain, is the effect of the imbibition of water through the skin, the rain having washed off or removed mechanically the delicate coat of *bloom*. The *glaucous* appearance on the leaf of the cabbage, *kale*, &c., on which the crystal drops of dew or exhalation are found early in the morning, before it is evaporated by the radiation of heat from the earth, is another instance of the peculiar character of this *exudation* (*vegetable wax*) repelling the water. In the opinion of the author, this arrangement in the cabbage appears to be a wise provision of nature. It is a well-ascertained fact, that the cabbage gives out in the twenty-four hours about sixteen ounces of pure water; so that although it repels water in any shape when applied externally, it is greedy for the same when presented to the roots; and Mr. Cooper is of opinion, that in those plants possessed of such power of exhalation, and where the exhaled fluid is in such abundance, they are wisely supplied with that peculiarity in the

leaves, for the express purpose of preventing absorption by those organs, and causing the exhaled fluid and condensed aqueous vapour to be repelled by the leaves, and to drop on the earth around the plant; thereby supplying it with fluid to some extent.

Almost every flower is furnished with a very delicate covering of this *waxy exudation*, for the purpose of protecting the beautiful delicate cells (of which the corolla is almost exclusively formed) from absorbing water, which would cause the flower to swell, and would interfere materially with the functions it is designed to fulfil.

In no part of the plant, however, is the existence of a *waxy secretion* more manifest, and more beautifully and admirably adapted, than in the *pollen* (the fertilising powder secreted by the thread-like organs in the flower). The pollen is, of all the organs of the plant, the most essential: without it the fertilisation of the dormant *orule* is not completed, and the vegetable flourishes, however, to no apparent purpose. Were it devoid of this *waxy coating*, it would most probably rupture when exposed to the weather before its appointed time (by the engorgement of its coats, on the principle of *Endosmose*), even before the final perfection of the pollen grains, whose office, in a physiological point of view, when dispersed on the naked secreting apex of the stigma, is of the utmost importance to the perfection, and fertilisation of the seed.

Mr. Cooper promised, on a future occasion, to continue his observations on this most interesting subject, and to mention in detail the vegetables which yield *wax*, in sufficient quantities for domestic uses, in South America, Africa, &c.

A continuation of Mr. Arthur Wallis's remarks on the "Flora of Essex" was read.

ROYAL BRITISH INSTITUTE OF BRITISH ARCHITECTS.

The Royal Institute of British Architects held its first meeting for the session,

Dec. 7. Earl de Grey in the Chair.

The recommendations of the council for the election of several distinguished scientific individuals abroad, as honorary and corresponding members, were read to the meeting and confirmed.

The Honorary Secretary, Charles Fowler, Esq, also read a list of some scarce and valuable works, which have been presented to the institution; including one by Vitrusius, published in Italy, in the 16th century, giving a description of a paddle-wheel, and some motive engine; evincing the progress in mechanical science at that period.

Mr. Poynder read a very interesting communication on Gothic Architecture, illustrated by some well executed drawings and plans, to prove that several complications of that order, which usually have been considered as unnecessary, were clearly designed by the masons of those days, to promote the stability of the structure.

A plan and elevation of a palace in the North of Europe, deposited by C. Tottie, Esq., was exhibited, as also some drawings of an old mansion-house still extant in England, supposed to have been built by Inigo Jones, prior to his erection of the Banquetting-house, Whitehall. A descriptive letter was read from C. J. Richardson, Esq., by whom the last named drawings were made and presented.

Mr. Nottingham laid before the directors specimens of Mr. Potts's newly-invented rail-moulding for hanging pictures, and pointed out to the members the great superiority of the patent rail over the ordinary rod, hitherto used for suspending pictures. The strength and elegance of this invention, and its ready adaptation as an architectural moulding, or the bottom member of the cornice, was much admired and approved.

Thanks were given to the respective donors, and to the noble chairman; after which the meeting was adjourned.

URANIAN SOCIETY.

Dec. 1. W. H. White, Esq., Vice-President, in the Chair.

A paper on Planetary Influence upon our Atmosphere, by Mr. C. A. Bowdler, was read, the purport of which was to present the arguments in favor of that theory.

The author considered planetary influence to be any operative power of celestial bodies upon terrestrial matter. He confined his remarks, however, to the influence exerted upon the atmosphere by noticing only those powerful agents which can in any way affect the gases of which our atmosphere is composed.

Electrical attraction and repulsion he regarded as the primary agents; the planetary bodies being subject to these forces alternately, as they reversed or changed the position of their angles; such reversion or change he entertained as sufficient circumstances for the alternate transference of electricity from one planet to another, according to the laws of electric phenomena.

Assuming light to be an electric result, he took that element into consideration, as affording an indication of the influence of planets on our atmosphere. The two principal properties of light received from the planets are intension and extension, or active and passive. The planets by their motions alternately change their constitution, and have a certain degree of intension and quantity of extension, yet they do not act upon terrestrial matter according to the true and real quantity which they have, but only according to their apparent intension and extension; that is, the greater their distance from the subjected body, the less their intension and extension. The sun and planets have both an active and passive virtue, but in the sun active virtue is predominant, and in the planets, extension or passive virtue.

The secondary property of planetary light is color; which we see the planets possess. There are only three primary colors, blue, red, and yellow, but there are various other colors produced from the celestial properties of the planets, causing a diversity of effects, by which we may discover the temperament predominating in each of the planets, by knowing the qualities of the color conveyed with their light. The planets possess the power of absorbing some of the colored rays which fall upon them, and reflect the others after contact with the body, therefore the reflected rays are in the same electric condition as the repulsive body. The prismatic colors have each distinct properties: thus the light green, or deepest yellow, throw more light than any of the other colored rays. The rays of the spectrum differ from each other also in their heating power, as noticed by Herschel; the maximum heat is just beyond the red ray without the spectrum. Others have found the greatest heat in the red ray itself.—"*Assuming the heating power of the violet ray* = 16 *deg.* — *that of the green is* = 26 *deg.* — *and the red is* = 55 *deg.* *" It is also found that the greatest chemical action is excited just beyond the violet ray; the next in energy is the violet ray itself. Now, if the particular colors of the planets signify their specific qualities, we may infer, by analogy with the quality of the prismatic color, that the red rays reflected from Mars produce great heat, while the blue or violet rays received from Saturn and Herschell are of a cold nature, and cause effects corresponding thereto. Then the red rays being most heating, and the blue or violet the most powerfully cooling—the intermediate rays, as the green and yellow, being between the two extremes of heat and cold, are consequently of a temperate and moistening nature.—Mercury is generally of an orange, and sometimes of a yellowish color, and so will cause dryness at one time, and at others moisture will predominate. It is probable the change of color may be accounted for by Mercury's great change of situation with respect to the sun and earth. When nearest the earth, or between the sun and earth, he is more powerful than when the sun is between the earth and Mercury.

Venus reflects the yellow and blue rays, consequently she produces effects in nature (similar to these rays) cooling and moistening.

Mars absorbs most of the rays except the red, which he reflects to us, and is therefore in nature hot and dry,—dry because the intensity of his heat dries up and evaporates all moisture.

Jupiter partakes of the qualities of heat and moderate moisture, being of an orange color, that is, red and yellow, which produces a temperate effect; the red, if any, predominating.

Saturn appears of a blue or lead color, the yellow being very faint, and consequently weak in operation. The blue predominating, will act in opposition to the moistening qualities of the yellow, producing cold, and at times also moisture.

Herschell is of a similar color to Saturn, and will, therefore, produce similar effects.

The Moon will chiefly cause moisture, varying in temperature.

The author concluded his paper by giving copious rules and directions for computing the amount of planetary influence, from a series of observations, the tables of which were appended, forming the conclusion.

The meeting then adjourned to January 5, 1841.

* Brande, 186.

SCIENTIFIC MEMORANDA, AND NOTES ON ART.

New Operation for the Curvature of the Spine.—The sub-cutaneous mode of operation, which has been practised on the Continent for some months past with signal success, as noticed in the INVENTORS' ADVOCATE, and which promises fair to become of general application in this country, consists in the division of the muscular and tendinous structures attached to the side of the spinal column, upon which the curvature or deformity exists. It was performed with the greatest dexterity on Tuesday week, at St. Bartholomew's Hospital, by Mr. Skey, in a theatre crowded to excess with practitioners and students, all eager to witness a proceeding which had for its end the removal of, perhaps, one of the most common deformities incidental to the human frame. The operation did not occupy more than ten seconds, and the wound in the skin did not exceed an inch in length.

Operation for the Cure of Wry Neck.—The *Lancet* contains a report of a recent operation by Dr. F. Snaith, of Boston, for the cure of wry neck. The doctor first passed the operating knife underneath, and then cut in an outward direction the tendinous portion of the sternocleido-mastoid muscle. The patient described the sound produced to him in cutting the tendon like that of breaking sticks across the knee, and at the moment of dividing it he felt excruciating pain. The operation occupied scarcely a quarter of a minute, and not more than two or three drops of blood followed. The side which had previously been depressed upon the shoulder bobbed up like an automaton figure suddenly set in motion. The wound caused by the introduction of the knife healed the next day, and in three days the patient was enabled to resume his usual employment. He has now the natural position of the head without any effort, and the defect is perfectly cured.

Fossil Cave in Morayshire.—A cave has been discovered in the old red sandstone at Hopeman, near Elgin. An eminent geologist, Mr. P. Duff, has furnished the *Elgin Courant* with a description of this geological treasure:—"A considerable part of the cave had been quarried away before its interest was suspected, nor until considerable quantities of bones had been exposed. It would appear, from the quantity of calcined wood and burnt stones which strewed the outer entrance, that the cave had been used by man as a shelter, in which the process of cooking had gone on; subsequently it had been taken possession of by foxes, or other predacious animals, which had hoarded the bones now found of deer, dogs, hares, rabbits, seals, birds, and fishes; but the most interesting feature of the cave is, that it proves by its contents the upheavement of an ancient sea beach, with its rolled pebbles, sea sand, and shells, lying undisturbed, and above them a mass of brown mould, evidently derived from the decomposition of animal matter. Many of the shells, such as the turpo and patella, may have been carried there for food, but the sand, besides being nearly half made up of fragments of shells, contains many entire specimens of minute shells which could not have been brought thither for any economical purpose either by man or animals. Here, then, we have a portion of the sea-shore or beach from 16 to 20 feet above high-water mark, with its sand, shells, and pebbles lying undisturbed, as they are seen lying and undisturbed on the beach which is washed by the ocean waves."

Fall of Meteoric Stones in Brazil.—On the 11th Dec., 1836, about half past 11 o'clock P.M., with a clear sky and S.W. wind, a fire-ball of uncommon size and brilliancy appeared over the village of Macoa, at the entrance of the river Assu; it immediately burst with a loud crackling noise, and a

shower of stones fell within a circle of 10 leagues. They fell through several houses, and buried themselves some feet deep in the sand, but they did not occasion any further damage than killing and maiming a few oxen. The weight of those picked up varied from 1 to 80 lbs.—*Poxzendorf's Annalem.*

Beryl of Aberdeenshire.—Dr. Fleming informs us that it occurs in contemporaneous veins of coarse granite in gneiss, at the Stonyhill of Nigg. It has been known as occasionally occurring in similar veins in the granite of Rubislaw, where in the rock itself some small tolerably perfect chrystals may occasionally be met with.—*Jameson's Journal.*

History of Caoutchouc.—About the beginning of the 18th century, a substance called *Caoutchouc* was brought as a curiosity from America. It was soft, wonderfully elastic, and very combustible. The pieces of it that came to Europe were usually in the shape of bottles, birds, &c. Nothing was known of its production, except that it was obtained from a tree, till the French Academicians went to South America in 1735, to measure a degree of the meridian. M. de la Condamine sent an account of it to the French Academy in the year 1736. He told them that there grew in the province of Esmeraldas, in Brazil, a tree called by the natives *Hhere;* that from this tree there flowed a milky juice, which when inspissated was *Caoutchouc.* Don Pedro Maldonado, who accompanied the French Academicians, found the same tree on the banks of the Maragnon; but he died soon after, and his papers were never published. Mr. Fresnau, after a very laborious search, discovered the same tree in Cayenne. His account of it was read to the French Academy in 1751.—*Dr. Thompson's Vegetable Chemistry.*

Volcanoes exist in all quarters of the globe, and, according to Jameson, about 193 active volcanoes have been observed; of which 13 belong to Europe, and its islands; 66 to Asia, and its islands; 8 to the islands of Africa; and 106 to America and its islands. Volcanoes have long been considered in the light of safety-valves, and this was the opinion entertained of them by Strabo, and it can scarcely be doubted that the tranquillity of the incandescent fluid mass, composing the earth's centre, is owing to these numerous vents, for the passage of steam, &c. Although volcanoes usually exist in the neighborhood of the sea, yet this is not invariably the case, as was once supposed. In Central Asia there is a volcanic region with an area of 2,500 square geographical miles, at a distance of upwards of 300 leagues from the ocean. They will frequently remain quiescent for many centuries, and again burst forth with renewed activity and vigor.—*Dr. Humble's Dict. Geol. and Min.*

Earthquakes.—We have again a remarkable example of the coincident occurrence of earthquakes in distant parts of the world. The town of Zante in the island of the same name, has been ruined by a series of terrific shocks between the 24th and 30th of October; and on the 26th of that month there was a shock at Comrie. The distance between these localities is nearly 1,700 miles, or 1-15th part of the circumference of the globe. The bearing is north west and south-east. It may be remembered that the great earthquake of the 23d of October last year, was felt simultaneously at Comrie, in Piedmont, and at Reggio, in Calabria—that is, over a line coinciding in direction with the present, and only a little shorter. If we prolong the line connecting Reggio and Comrie further northward, it strikes Mount Hecla in Iceland, and may thus be said to have an active volcano at each extremity—Ætna at the one, and Hecla at the other. Its length will be 2,300 miles, or 1-11th part of the circumference of the globe. It is extremely probable that by and by we shall hear of earthquakes between the 24th and 30th of October in the Alps or Appennines, or at other intermediate localities.—*Scotsman.*

Institution of Civil Engineers.—The Council of the Institution of Civil Engineers have awarded the following Telford Premiums:—A medal in gold to Josiah Parkes, M. Inst. C.E., for his two papers "On Steam Boilers," and "On Steam Engines, principally with reference to their consumption of steam and fuel." A medal in silver, &c. to James Leslie, M. Inst. C.E., for his "Account of the Works of Dundee Harbour," with plans and drawings of the works and the machinery employed there. A medal in silver, &c. to Robert Mallet, Assoc. Inst. C.E., for his paper "On the Corrosion of Cast and Wrought Iron in water." A medal in bronze, &c. to Charles Bourns, Assoc. Inst. C.E., for his paper "On Setting-out Railway Curves." A medal in bronze, &c. to Henry Chapman, Grad. Inst. C.E., for his "Description and Drawings of a Machine for describing the Profile of a Road." A medal in bronze, &c. to Henry Renton, Grad. Inst. C.E., for his "Description and Drawing of a Self-acting Wasteboard on the River Ouse." Books of the value of five guineas, to Eugenius Birch, Grad. Inst. C.E., for his "Drawings and Description of the Machine for Sewing Flat Ropes, in use at Huddart's Rope Manufactory." Books of the value of two guineas, to T. J. Maude, Grad. Inst. C.E., for his "Account of the Repairs and Alterations made in the Construction of Menai Bridge, in consequence of the gale of January 7th, 1839." Books of the value of two guineas, to Andrew Burn, Grad. Inst. C. E., for his drawings of a "Proposed Suspension Bridge over the Haslar Lake."

Polytechnic Institution.—This exhibition of the works of science and art was re-opened this day, after having been closed for some time, for a re-arrangement and improvements. The "private view" on Thursday was too crowded to afford a good opportunity of forming an opinion on the new arrangements and additions. We intend giving a full description in a subsequent number. Prince Albert honored the Institution with a visit on Wednesday, and seemed much delighted with the numerous curious models and exhibitions. He went down in a diving bell, which still forms a conspicuous and interesting feature in the principal hall.

Action of Sea-water on Glass.—At a meeting of the Philosophical Society of St. Andrew's, on Monday, Sir David Brewster exhibited a bottle of wine from the Royal George, which had been exposed to the action of sea water. This bottle he received from Mr. Lyell, of Kinnerdy, for the purpose of examining the remarkable decomposition of the glass produced by the action of salt water. The thin films of glass which covered the bottle like a silvery incrustation had all the properties of the brilliant scales of decomposed glass found in Italy, and produced by nearly 2,000 years' exposure to the elements. Upon a careful examination of the surface of the bottle, Sir David found that the scales were throughout filled with veins like those of agate, and coincided with the lines in which the glass had been twisted in the mechanical operation of forming the bottle. The lines in which the cohesion of the particles of the glass was the least were the soonest decomposed by the action of the sea water. This curious fact disclosed the cause of the similaly waved structure in the decomposed glasses of Greece and Rome.—*Scotsman.*

Tractive Power of the Horse.—Mr. E. Morris has communicated to the Franklin Journal some important experiments on this question; whence he takes the mean day's work of horses fully loaded, to be as follows:—Of *picked* horses at 16½ millions of pounds, lifted one foot high per day. Of *common* horses at 12 9-10 millions of pounds, lifted one foot high per day. This average result for *common* horses is equal to a continued pull of nearly 135¾ lbs. at the rate of 2¼ miles per hour for 8 hours out of the 24. The pace of 2¼ miles per hour, or more accurately 200 feet per minute, has been ascertained by the writer from numerous experiments upon horses hauling earth for embankments in single carts, as well as from some trials with teams of four, to be that at which horses in common use on public works generally proceed when working with full effect. *Note.*—The horses employed upon public works, averaging the working time of the whole year, are worked nearly 10 hours out of 24 hours; for which time however they would only be able to exert a mean force equal to a steady pull of about 108½ lbs., and the pace and the dynamical results would both be found to remain nearly as above.

Deposit of Iron on Roads.—It has been calculated, by an engineer of eminence, that every four-horse coach deposits 12 lbs. of iron in every 100 miles of its journey, and that, consequently, assuming the number of such coaches passing daily between London and Birmingham alone to be 20, the weight of iron deposted during every combined transit exceeds 250 lbs. These results, it is stated, are not conjectural, but derived from investigations applied to the horseshoe, and the tire of the wheel—in the first instance previously to use, and in the second after the wear and tear of the road had rendered them useless; and they have been found, it is added, as to every ton weight of iron so tried, nearly uniform.

Pressure of the Sea.—If a piece of wood, which floats on the water, he forced down to a great depth in the sea, the pressure of the surrounding liquid will he so severe that a quantity of water will be forced into the pores of the wood, and so increase its weight that it will be no longer capable of floating or rising on the surface. Hence the timbers of ships, which have foundered in a deep part of the ocean, never rise again to the surface like those which are sunk near the shore. A diver may, with impunity, plunge to a certain depth in the sea; but there is a limit beyond which he could not live under the pressure to which he is subject. For the same reason, it is probable, that there is a depth below which fishes cannot live. They have, according to Joselin, been caught in a depth at which they must have sustained a pressure of 80 tons to each square foot of the surface of their bodies.

Substitute for Door Springs.—Mr. J. Gilchrist submitted to the Society of Arts for Scotland, last year, an ingenious method of applying lever power instead of springs, for the purpose of shutting, and keeping shut, doors opening either way; and by which the greatest power is obtained just where it is wanted, viz. when the door is shut.—*Jameson's Journal.*

VARIETIES.

To Architects and Builders.—It is desirable that public attention should be called to an Act of Parliament passed in the last session, and which, we fear, has not received that notice which it deserves, as it affects so generally all occupiers of houses and other buildings having chimneys. It is thereby enacted that after the passing of the Act, "all partitions between any chimney or flue shall be of brick or stone, and at least equal to half a brick in thickness;" such partition to be of sound materials, "and the joints of the work well filled in with good mortar or cement, and rendered or stuccoed within;" that such chimney or flue in any wall, not being a circular chimney or flue 12 inches in diameter, shall be in every section of the same not less than 14 inches by 9 inches." The angle at which it is lawful to build any chimney is also determined. Another clause enacts, "that from and after the 1st day of July, in the year 1842, any person who shall compel or knowingly allow any child or young person under the age of twenty-one years to ascend or descend a chimney, or enter a flue, for the purpose of sweeping, cleansing, or coring the same, or for extinguishing fire therein, shall be liable to a penalty of not more than TEN POUNDS, or less than FIVE POUNDS."

Female Musicians.—A general meeting of the Royal Society of Female Musicians was recently held to receive the treasurer's report, which was highly satisfactory. The society has been enabled to invest a considerable sum in the funds, besides defraying the current expenses of the year.

Royal Authors.—Her Royal Highness the Princess Amelia of Saxony has just published the first volume of her "Théâtre Complet," the proceeds of which are to be bestowed upon the various benevolent institutions of Dresden. This volume contains three comedies, *Die Unbelesene* (The Illiterate Lady), in three acts; *Die Stieftochter* (The Step Daughter), in four acts; and *Pflicht und Liebe* (Duty and Love), in five acts. The first representation of a new drama by the royal and accomplished authoress took place at the Theatre Royal, Dresden. This drama is called *Der Hauptman Firnewald* (Captain Firnewald). It was received with loud expressions of admiration and enthusiasm from the audience.

Prevention of Literary Piracy.—The Dukes of Lucca and Modena have acceded to the convention between the Emperor of Austria and the King of Sardinia, for the mutual protection of the literary works and productions of artists published within their respective dominions.

Reading Rooms for the Working Classes.—Sir Robert Peel has intimated his intention of giving £100 towards the establishment of a reading room at Tamworth for the working classes of that neighbourhood, besides becoming an annual subscriber to a liberal amount.

A Large Steam Dredger.—There was launched, on the 27th October last, at Clyde Bank, a new steam dredging vessel for the River Clyde trustees. This vessel is the largest of the kind which has yet been built on the Clyde; she is 100 feet long, and 22 feet broad; she is to carry an engine of 24 horse power, and to work effectively in 18 feet depth of water. The engine for this vessel has been constructed by Mr. John Nelson, of Oak Bank Foundry, in accordance with the specification drawn up by Mr. Bald, engineer of the Clyde.

Explosion of a Boiler.—On Saturday morning, about a quarter past 8 o'clock, the inhabitants in the neighbourhood of Holmscroft Brewery, Greenock, were alarmed by a strange noise, followed by the falling of the brewhouse. It was found that the boiler, which was on the ground floor, had exploded and gone right through the roof of the house, a height of four stories, and alighted in a field about 120 feet distant. When the explosion took place Mr. Wallace, the brewer, and his assistant, were standing immediately under the mash-tun in the third flat, and how they escaped with their lives is a miracle to every one, and to none more than to themselves. When the steam and dust cleared away, Mr Wallace was seen walking up the field in which the boiler lay, but how he got there he had not the most distant idea. The under brewer, who was talking with him when the explosion took place, was dragged out from under the ruins. He was very severely scalded. A man was working in a drain within 10 feet of the boiler when it blew up, and the stones of the building fell around him, but without hurting him. Another man was slightly injured by some of the stones. It happened fortunately that nearly all the workmen were engaged in the yard, at a considerable distance from the brewhouse. What is not a little singular is, Mr. Wallace's shoes were forced off his feet by some means, and have not since been seen; his hat, too, which was on his head at the time, was found on the following day among the ruins very much cut, and a thermometer which he held in his hand was got at a considerable distance from the spot. A more remarkable escape than Mr. Wallace made has rarely, if ever, occurred. The mash-tun under which he stood is now buried in the ruins, and a large copper in a higher flat, containing 30 or 40 barrels of boiling water, was torn to pieces. In short, the house, with the whole brewing utensils, is completely destroyed.—*Greenock Advertiser.*

Bursting of a Grindstone.—On Tuesday a man named Joseph Cook, a sithe grinder, lost his life from the bursting of a stone upon which he was grinding. This employment is attended by considerable danger, as the large stones which are used not unfrequently break, when the fragments are scattered in every direction with amazing force. The deceased, at the time he met his death, was at work in the position practised at the Gloucestershire sithe mills, he was lying down: consequently his head was over and near to the stone when it burst, and a portion of it, hitting him on the face, forced one eye from the socket, and otherwise greatly injured his head, so that the poor fellow never spoke after, and died in about 20 minutes. An inquest was held on the body, and a verdict of "Accidental death" returned. —*Worcester Chronicle.*

Coaches against Railways.—The *Doncaster Chronicle* contains the following paragraph:—"The town, for the last ten days or a fortnight, has evinced some of the appearances of the good old times, before the facility of railway travelling swept from off the Great North Road the handsome and comfortable travelling carriages of the nobility and gentry. The prevalence of railway accidents, and the serious nature of most of them, have, however, lately had the effect of inducing many to return to the old system of posting—from a confidence in its safety. The last ten days, it has been no unusual thing to see carriages and four and the more humble post-chaise passing through our town; and unless greater security against accidents be afforded to the public, posting will, in a great measure, be resumed by those whose business or engagements do not require such unprecedented haste."

The Theatres.—Sir E. L. Bulwer's play, *Money*, was produced at the Haymarket on Tuesday. The influence of wealth is, as might be concluded from the bill, the point chosen for illustration. There is nothing new in the general idea, nor in the incidents by which the action is worked

out; but the scenes are well contrived for dramatic effect, and the dialogue is written with spirit. Sir E. L. Bulwer has, in this instance, established his reputation as a successful playwright at least. *Money* was eminently successful; to which result the admirable manner in which it is put on the stage by Mr. Webster, and the excellent acting of Mr. Macready, greatly contributed. All the parts were well cast, and the audience expressed themselves so satisfied, that this new Issue from Mr. Webster is likely to bring much sterling back to the treasury.

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ACTS OF PARLIAMENT.

PATTERNS,—
27 Geo. III., c. 38; 2 Victoria, c. 13; 2 Victoria, c. 17. (The last relates to patterns and *models*.)

PATENTS FOR INVENTIONS,—
2 and 3 Victoria, c. 67.

SCULPTURES,—
38 Geo. III., c. 71.

ENGRAVINGS,—
7 Geo. III., c., 38; 17 Geo. III., c. 57.

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8 Anne, c. 19; 12 Geo. II., (Booksellers' Act), c. 36; 5 Geo. III, (Universities' Act), c. 53; 54 Geo. III. (General Copyright), c. 156.

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THE

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AND JOURNAL OF INDUSTRY;

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ELECTRICITY DEVELOPED FROM HIGH PRESSURE STEAM.

The curious discovery lately made of the development of electricity on the escape of high pressure steam, has excited much attention. We last week gave an account of some experiments made by Mr. Armstrong and by Mr. Pattinson, on the steam issuing from the boilers of locomotive engines, which place the phenomenon, which was at first doubted, beyond all question. The length of the sparks given out, and their rapid succession, show that the quantity of electricity thus brought into action, is much greater than was at first supposed possible. It has become, therefore, a curious question to determine in what manner this large quantity of electricity is excited.

Mr. Armstrong imagined, from the results of his first experiments, performed with steam evaporated from water impregnated with lime and other mineral substances, that the effects were to be attributed to the different kinds of water employed. He found, for instance, in those experiments wherein rain-water was used in the boiler, that the traces of electricity from the steam were scarcely perceptible; whilst the steam from the impure waters produced, under apparently similar circumstances, great electrical effects. He was subsequently, however, induced to alter this opinion; for he found that steam which had given out electricity in abundance, when issuing from one aperture, produced no indication of it when issuing from an orifice similar to that through which the rain-water steam had issued. The tendency of the later experiments goes entirely to prove, that the electrical effects depend on the degree of pressure of the steam and the conditions of its escape, and not upon the nature of the water from which the steam is evaporated. We may observe, in passing, that these opposite results, from apparently similar experiments, show the necessity of the greatest caution in attending to all the circumstances of an experiment before any conclusion is arrived at relative to the causes of assumed differences.

We find that some of the philosophers of the French Academy of Science are now taking up Mr. Armstrong's original, but now abandoned, notion of the cause of these curious results from his experiments. At a meeting of that learned body, in which the discovery of the development of electricity from high pressure steam was discussed, M. Peltier observed, as the result of his experiments, that pure distilled water gives no traces of electricity when evaporated; but that water containing saline matter, in solution, evolves it abundantly. He thence infers, that the boilers whence the electrical steam escaped in the English experiments, must be incrusted by saline deposits from the water; and it is to this circumstance he attributes the electrical effects of the steam, without in any manner attempting to explain why these assumed saline deposits should produce such extraordinary effects. A similar notion seems to be entertained by Dr. C. Schafhaeutl, in an article inserted in the last number of the *Philosophical Magazine*. But it seems to us very clear, from the experiments performed by Mr. Armstrong and by Mr. Pattinson, under circumstances peculiarly favorable, and by well-conceived arrangements, that the development of electricity is altogether independent of the nature of the steam, and is to be attributed entirely to the circumstances of its escape from the boiler. When the escape is sudden, the effect is greatest; and when, either from the diminution of the pressure, or from the large size of the orifice, the intensity of the expansion of the effluent steam diminishes, the electrical phenomena decrease in proportion. It was proved that the steam in the boiler, when not escaping, exhibits no signs of electricity; and that it is during the rushing out of the steam alone that the effects are produced.

We have then to consider, by what means does the escape of steam produce electricity? It seems to us that the phenomenon itself affords its own and ready explanation; which all the attendant circumstances of the experiments confirm. It has been long well known that evaporation is one of the exciting causes of electricity; and that the more rapidly evaporation is carried on, the greater is the intensity of the electricity produced. For instance, when a hot cinder is put into a small cup of water, a quantity of electricity is produced, which is plainly indicated by the electrometer. In proportion to the degree of heat of the cinder, and the consequent rapidity of the evaporation, will be the intensity of the electricity evolved.

The rationale of this experiment may be readily explained on the theory which assumes that there exists a universally pervading electric fluid for which every substance has a given capacity, and that electrical phenomena occur only when the natural equilibrium of quantities is disturbed. This theory also supposes, that the capacity of a body for electricity increases with its increase of bulk, as is generally observable in the case of caloric. Upon this hypothesis, therefore, we can satisfactorily account for the development of electricity by the sudden evaporation of water. The water, when converted into steam, has a greater capacity for the electric fluid than before, owing to the great enlargement of its bulk. The steam, therefore, abstracts electricity as well as heat from the water (if heat and electricity be not modifications of the same principle), and the latter is left in a negative, or minus, state. If the evaporation be conducted so slowly that the water can derive a supply from surrounding bodies as quickly as its electricity is abstracted, no electrical phenomena are apparent; but in proportion to the suddenness of the change of state will necessarily be the perceptible effects. Let us, then, apply this theory to the explanation of the electrical phenomena developed by the escape of high pressure steam.

So long as the steam produced is confined within the boiler, no change in the capacity for the electric fluid takes place. The water and steam together still occupy the same bulk; and their electrical state, we may suppose, remains unchanged. But the instant that the compressed steam is allowed to escape, its expansion increases the capacity for electricity, which it abstracts from the boiler, and from all immediately surrounding bodies. The steam thus escaping has exactly the same relation to the water in the boiler as steam rapidly evaporating has to the water into which a hot iron or cinder is introduced; only in the case of high pressure steam the expansion must be the more rapid.

The steam thus escaping and expanding, having absorbed from the boiler and engine an increased quantity of electricity, which its new state gives it the capacity to receive, becomes almost as rapidly condensed into water, on being exposed to the cold of the atmosphere. This condensed steam, therefore, contains a larger quantity of electricity than its natural capacity will enable it to absorb. The electricity which it abstracted from the boiler is thus liberated, and ready to be communicated to the nearest conductor. The electricity of the condensed steam must consequently be positive, or *plus*, whilst

that of the boiler is negative. The experiments of Mr. Pattinson fully confirms this view of the phenomenon; for, by insulating the boiler, it gave powerful indications of negative electricity.

As the steam rushes out of the boiler with such great velocity, it may be reasonably inferred that it does not obtain, on the instant, a quantity of electricity sufficient to supply its suddenly enlarged capacity; and that the escaping steam, *until condensed*, is in a negative state as well as the boiler. The experiments bear out such an inference; for we find that the *maximum* quantity of electricity is not obtained until the conductor is held in the vapor several feet above the aperture from which it escapes.

From the preceding consideration of the nature of the phenomenon, it appears that the development of electricity, from effluent steam, is merely a modification of the phenomenon before known of the development of steam by evaporation. The evaporation of the water in the boiler does not commence, —for the disturbance of the electrical equilibrium at least—until the steam is allowed to escape. Its sudden expansion, by increasing its capacity for the electric fluid, disturbs the equilibrium more quickly than it can be restored; and its subsequent condensation occasions the development of the free electricity which these experiments have exhibited. Now that the phenomenon has been discovered, it seems strange that the effect of the sudden escape of high pressure steam should not have been calculated *a priori* long ago. The discovery, like most others, has been accidental; and we have no doubt it will lead to many practical and beneficial results.

THE PRESERVATION AND PREPARATION OF WOODS.

We have occasionally noticed the important process discovered by Dr. Boucherie, of impregnating the fibres of woods with preserving or coloring substances, by employing only the absorbing vital action of the tree. The French Academy of Sciences have recently appointed commissioners to examine and report more particularly on the merits of this invention. The following is their report, which was lately read at a meeting of the Academy. It is most satisfactory as to the success of the absorbing process.

"The Academy," says the reporter, "has already witnessed the preparations of the inventor with great interest; there at the present time such remarkable specimens under its inspection that the task of the commissioners is singularly abridged.

"Doctor Boucherie has endeavored to render wood much more durable; to preserve its elasticity; to prevent the variations to which it is liable from dryness and moisture; to diminish its combustibility; to increase its tenacity and durability; and, in short, to impart a variety of durable colors, and even a variety of smells to wood. To say that all these requisites have been attained, and that they have been so by unexpensive, simple, and novel means,—that the substances used to accomplish this are easily procured and of very low price, is sufficient to direct the attention of the Academy to the most important results of the process we have under consideration.

"In short, in order to impregnate a whole tree with coloring or other substances, the inventor does not make use of any complicated mechanical or expensive means; he finds all the requisite power in the absorbing power of the vegetable itself, and this is sufficient to convey from the bottom of the trunk, even to the leaves, all the fluids that are to be injected, provided they are not concentrated. Thus if a tree in full sap is cut at the root and plunged into a tub containing the fluid that is required to ascend, it will in a few days reach the highest leaves, all the vegetable tissue will be pervaded with it, except the heart of the tree, which when the wood is hard and the tree old resists the imbibation.

"It is not even necessary that the tree should have all its branches and leaves when the process is performed, a little foliage at the top will be sufficient to attract the fluid.

"It is unnecessary to keep the tree in an erect position, which would often render the operation impracticable. It may be cut down, and its trunk put in connection with the liquid prepared for the absorption; which then penetrates every part of it in the usual manner.

"In fact it is not necessary to cut down the tree, for a hole dug at the root, or an incision in the bark sufficient to admit of the open part being brought in contact with the liquid, would cause its rapid and complete absorption.

"These impregnations, which are effected without difficulty and without trouble in a few days, differ, as we see, very materially from all the methods hitherto adopted. The pieces of wood previously cut, which were formerly operated on, were not impregnated without the use of powerful machines, or by the prolonged action of the fluids in which they were immersed.

"The ingenious and novel process adopted by Dr. Boucherie places an immense natural power at disposal for the process of impregnation, and has the advantage of conduting into the most delicate vegetable tissue any soluble substance that may be considered desirable; and this without any expense.

"If the author has solved the great problem that he first proposed in an easy and simple manner, he has not displayed less sagacity in the choice of the substances that he has adopted to answer all the purposes before announced.

"If the object be to increase the durability or hardness of the wood, or to prevent its being injured by dryness or moisture, it must be impregnated with crude pyrolignite of iron. This substance is quite unexceptionable, because it is produced from the pyroligneous acid, in all forests, by the making of charcoal. It is easy to convert the latter into pyrolignite of iron, by placing it in contact, even when cold, with pieces of old iron, and, in short, the liquid thus prepared contains a great deal of créosote, which, independently of that salt of iron, possesses the property of hardening the wood and of preserving it from decay, as well as from the devastation occasioned by insects in the wood used for building. Besides, well-authenticated experiments have incontestibly proved that the woods prepared by this process are more durable.

"If the object be to preserve all the pliability, and to render wood less combustible, the inventor has discovered means of accomplishing this at very little expense, by using chlorides of different kinds. Always under the impression that his process will be universally adopted, he is not satisfied with chloride of lime—the expense of which is so inconsiderable—he has made trial of the mother waters of salt works; a produce which has hitherto been considered of no value, but in which he has discovered all the requisite properties. The woods prepared by means of these saline solutions, retain their flexibility after many years' exposure to the air. The small leaves may be twisted in a spiral form, and afterwards untwisted in an opposite direction without cracking. When exposed to the air they do not break, and never split, however dry they may be: in short, they do not burn, or at least they burn with so much difficulty, that when on fire, the fire could not extend.

"To these numerous and useful properties, which in ship-building, or the construction of private houses and manufactories, will be of so much importance, he has applied the principle to other purposes, which, though not so important, promise new materials for the arts. The woods are stained in such a variety of shades, and so curiously variegated, that the cabinet-maker who uses the common wood must derive great advantage from it. We dispense with all details of this kind that were submitted to the Academy; it is sufficient to state that the pyrolignite of iron alone produces a very beautiful brown tinge, that after the absorption of the pyrolignite, the absorption of a tanning substance produces ink in the mass of wood; and in the same manner it can be colored blue, black, or grey.

"By absorbing, first, pyrolignite of iron, and afterwards prussiate of potash, a prussian blue is produced.

"By successively introducing acetate of lead and chromate of potash, a chromate of lead is formed.

"By impregnating the same tree with pyrolignite of iron, with prussiate, with acetate of lead, and with chromate of potash, shades of blue, green, yellow, and brown are produced, which have the most varied effect.

"These colorings admit of infinite variety. To a certain extent it depends on the taste of the consumers to regulate their application; chemistry is sufficiently rich in re-agents of this kind to satisfy the most exacting wants and caprices.

"We have nothing at present to say of woods rendered odoriferous by similar impregnations. It is an application too easily understood and too much confined to the demands of luxury to be brought into comparison with the important results that have just been enumerated.

"It is evident, merely on the recapitulation of these results, that they have not been and that they could not be discovered by accident. The inventor has deduced them from original ideas; the consequence of a long, profound, and attentive consideration of the subject."

The commissioners then acknowledge the, priority of M. Boucherie's claim to the discovery which had been contested for a short time by M. Millet, overseer of the rivers and forests.

"In considering the whole of M. Boucherie's labors, the great and costly experiments to which he has devoted himself, the important results he has already obtained, and those which may be hoped from the future, your commissioners have not confined themselves merely to the proposal of these measures, which would be sufficient if the interest of science only were in question.

"They have considered that on a question of public utility, in which our navigation, our public works, our manufactures, are so largely and so deeply interested—in which our agricultural interests are so materially affected by the re-establishment of our forests, now so unfortunately cut down—something more was necessary than a testimony of ordinary approbation. The commissioners therefore propose with confidence,—

"1st. That the memoir of Mr. Boucherie shall take that place among the works of foreign philosophers of which it is so eminently deserving.

"2d. That a copy of this report be sent to the Minister of Agriculture and Commerce, the Ministers of the Public Works and the Marine, and the Ministers of Finance and of War."

ON THE PROPERTIES AND CHEMICAL CONSTITUTION OF COAL.

We have recently given reports of some lectures delivered at Liverpool, by Mr. Williams, on combustion, and on the best means of producing the greatest quantity of heat from a given quantity of fuel. A paper "On the properties and chemical constitution of coal, with remarks on the method of increasing its calorific effect," was lately read at the Institution of Civil Engineers, written by Mr. Charles Hood. The *Civil Engineer* gives an abstract of the paper, with a report of some remarks on it by Mr. Parkes, of which we avail ourselves; the subject being extremely interesting and at present but imperfectly understood:—

The author considers his subject under three heads:—1st,—The chemical character and compo-

sition of coal; 2dly, Its properties as a combustible; and 3dly, The nature and application of its various gaseous products.

1st. The opinion that coal is a compound of carbon and bitumen has been objected to by some chemists, on the ground that by no process hitherto pursued in analysis has it been possible to resolve it entirely into these two substances; even at a low temperature a quantity of gaseous matter is thrown off, and at an elevated degree of heat an evident decomposition of the bitumen takes place. Even anthracite contains a small portion of volatile matter, its component parts being carbon, oxygen, hydrogen, and nitrogen; the hydrogen being either combined with the oxygen to form water, or with a small portion of carbon to form carburetted hydrogen, which exists in a gaseous state in the pores of the coal. In bituminous coal, the hydrogen is combined with a larger portion of oxygen and nitrogen; the mechanical difference being, that the bituminous and free-burning coals (more particularly) melt by heat when the bitumen reaches the boiling point, whereas anthracite is not fusible, nor will it change its form, until it is exposed to a much higher degree of temperature.

Two tables of the analyses of different coals are given from the authorities of Mushet, Thomson, Vanuxem, Daniell, Ure, and Reynault; No. 1 showing the proportions of carbon, ashes, and volatile matter, with the specific gravity of the coal and of the coke; and No. 2 showing the proportions of carbon, hydrogen, azote, and oxygen. These tables show that the largest quantity of carbon (92·87) is contained in the Kilkenny anthracite, and the least quantity (61·72) in cannel coal; and that the nature of the volatile matter greatly affects the quantity of coke—the aggregate quantity of the gaseous products of coking, splint, and cherry coal, being very nearly similar; while the quantity of coke obtained from these different species varies more than 45 per cent.

The author then points out the continual presence of azote, which quits the base with the greatest difficulty; and also the affinity of sulphur, not only for the coal, but for the coke, as it is rarely found to have been completely expelled, even from the most perfectly made coke; the only coal found to be even partially free from it being anthracite, in some species of which no traces of its presence are found.

2dly. The application of coal as a fuel depends on the chemical change which it undergoes in uniting, by the agency of heat, with some body for which it possesses a powerful affinity. In all ordinary cases this effect is produced by its union with oxygen. When coal is entirely consumed, the carbon is wholly converted into carbonic acid gas and carbonic oxide, and the hydrogen into water in a state of vapor. The atmosphere supplies the necessary oxygen for this purpose; and in this state the products of the combination are nearly or quite invisible, both of them being almost colorless fluids; if, therefore, any smoke be visible, it is the result of imperfect combustion. Some calculations are given to ascertain the amount of loss that is sustained when the smoke escapes unconsumed; from which it appears, that with bituminous coal about 37 or 38 per cent. more heat is produced when the smoke is consumed than when it escapes freely. Many modes of consuming smoke have been attempted; those which appear to have been attended with the greatest success are—1st. Causing the smoke from the fresh coals to pass through or over that portion of the fuel which is more perfectly united; 2dly. Supplying heated air to the top of the fuel, as well as admitting cold air through the ash pit in the usual manner; and 3dly, Throwing a jet of steam into the furnace or into the chimney. The various modes of carrying into effect these plans are briefly alluded to; from them a few may be selected. Robertson's plan was to use inclined furnace bars, where the fresh coals were placed close to the fire-door, and being there partially carbonized, gave out the gas, which, in passing over the mass of incandescent fuel, was ignited, and became active flame; thus economising fuel and preventing smoke. In this and similar cases, by the slow distillation of the coal, a gas is produced, which not only inflames at a lower temperature than the dense olefiant gas produced by rapid distillation, but which only requires for its combustion a quantity of oxygen never exceeding double its own volume, or ten times its bulk of atmospheric air, while olefiant gas requires three times its own volume of oxygen, or fifteen times its bulk of atmospheric air. The elimination of a gas which burns with so small a portion of oxygen is, therefore, the principal cause of the non-production of smoke in furnaces of this description. The second mode of consuming smoke is founded on the necessity which exists for a large supply of air being requisite to inflame the gases given off from coal by a rapid and intense heat; and this is accomplished by introducing a quantity of heated air above the burning fuel. When a quantity of fuel is thrown into a furnace, the increased thickness of the mass opposes additional resistance to the passage of air through the bars; the temperature of the furnace is lowered, and an increased volume of gas is at the same time given out. If at this moment a quantity of air, heated to the temperature of the gas, be admitted, the gas immediately inflames, and that which would have produced a dense black smoke passes off in the invisible state of carbonic acid gas and vapor of water. Different gases require different degrees of heat to inflame them; and this explains the easy combustibility of the volatile products of coal when the heat is so managed as to produce those gases which inflame at the lowest temperature. A larger quantity of air is required at the time that the coal is first thrown on than at a subsequent period; therefore, when economy is studied, the supply of air should be gradually diminished as the mass approaches an incandescent state. The use of heated air has produced most important results in the manufacture of iron with bituminous coal, and also with anthracite; the latter fuel having been almost neglected until the recent application of this principle of employing heated air to promote its combustion, although it is known to be capable of producing, perhaps, a more intense heat than any other carbonaceous fuel. The rationale of the third plan of consuming smoke by injecting a jet of steam into the fire or the chimney, is less obvious than the others. In 1805, Mr. Davies Gilbert observed, that whenever the waste steam of one of Trevithick's engines was permitted to escape into the chimney, the smoke from the coal was rendered invisible. Subsequent experiments confirmed this fact; and it was supposed that the steam, being decomposed, furnished oxygen to support combustion. The author combats this opinion, and accounts for the effect by the increased draught of the furnace caused by the jet of steam into the chimney, by which means a larger portion of air is brought into contact with the burning fuel; thus supplying the previous deficiency of oxygen to the fire, and promoting the combustion. As steam is only about half the weight of air at a like temperature, and the power of all gaseous fluids to ascend is "*inversely* as the square roots of their specific gravities," the velocity of its escape by the chimney, compared with common air of the same temperature, is about as 1·4 to 1; therefore the compound mixture of steam, air, and carbonic acid gas, will escape with a considerably increased velocity, and more air must consequently enter the furnace. It appears that about 10 per cent. of the total quantity of steam generated is necessary to effect the combustion of the smoke by this means; therefore, unless the waste steam only be used, the saving of the fuel must be reduced by this amount. Brief mention is made of the experiments of Messrs. Apsley Pellatt, Parkes, and the Chevalier de Pambour, proving that a given quantity of oven coke will produce as much heat as the coal from which it was produced; and of the various kinds of artificial fuels which had been invented, especially that composed of resin and [peat coke, of which the author remarks that its combustion probably produces a mechanical effect, as the hydrogen is converted into water in a state of vapor, which escapes through the chimney with a great velocity, and consequently a large quantity of air is drawn into the furnace, and a more perfect combustion of the fuel is the result. In the same manner he accounts for the necessity which exists for having the openings between the bars wider in a furnace in which coke is burned than in one used for coal. In opposition to the general opinion, he considers that less air is required for the consumption of coke than for coal; the carbon only requiring $2\frac{1}{2}$ times its weight of oxygen for its combustion, while the hydrogen contained in coal requires 8 times its weight of oxygen; and the only reason that the openings between the bars are required to be wider in the former than in the latter case, is in consequence of the draught being so much slower during the combustion of smoke.

3dly. "On the nature and application of the volatile products of coal." In treating this portion of the subject—many of the observations on which have been necessarily anticipated in the preceding sections—the author traces the application of carburetted hydrogen gas to the purposes of artificial illumination from the year 1798, when its first successful application was made by Murdock at Soho; he then proceeds to Dr. Henry's investigations of the phenomena of its production and combustion; the variation of the intensity of light obtained from carburetted hydrogen, due to the proportion of carbon contained in it; the difference in the gas obtained from different qualities of coal; the superiority of the illuminating power of the gas from cannel coal; and the still greater power of that produced from the decomposition of oil, which is 2 to $2\frac{1}{2}$ times greater than that of coal gas. He then mentions the other products of coal by distillation, such as ammoniacal liquor, carbonic acid and oxide, sulphuretted hydrogen, tar, essential oil, naphtha, petroleum, asphaltum, and other substances. The paper concludes by pointing out the advantages which would result from the production of such gas as is usually given out at the beginning of the distillation of coal, as it contains two volumes of gaseous carbon united with two volumes of hydrogen, and its illuminating power is consequently more than double that of ordinary coal gas.

Mr. Parkes observed, that the quantities of air required for the combustion of different fuels as determined in the laboratory and on the large scale of practice, were frequently very different. It might be quite correct that a given weight of coal would require more air for its perfect combustion than the same weight of coke. There was great difficulty in ascertaining the fact practically, under steam-boilers, as the gases given out by the coal must have air supplied to them distinct from that which passed through the grate to ensure their perfect ignition, and many circumstances prevented the consumption of air from being exactly measured. Generally, he had found it necessary to use wider spaces between the grate bars for coke than for coal. In some late experiments very carefully made on a boiler invented by Mr. A. M. Perkins, equal weights of coal and coke required the same time for their destruction on the same grate, the apertures of the damper and ash-pit door, which were used to govern the draught, being precisely the same. Coke effected a greater evaporation than coal at similarly rapid and slow rates of combustion; and in every case the temperature of an oil bath at the foot of the chimney was higher with coke than with coal. It must, however, be remarked, that no process had been used to ignite the gases which escaped from the furnace uninflamed. He had tried different kinds of coke, coal, and anthracite at this boiler, and the same fuel in every instance performed a greater evaporative effect at a slow than at a rapid rate of combustion. He thought that much of the air which entered the grate of a boiler passed through the fire unconsumed, for want of time to effect a sufficiently intimate combination with the fuel. In some experiments lately made at Swansea on the properties of anthracite, Dr. Schafœutl had found from analysis, that no less than 40 per

cent. of the products of combustion taken from the chimney consisted of oxygen, yet he had effected the large evaporation of 11 lb. of water with 1 lb of that fuel.

ATOMIC WEIGHT OF CARBON.

MM. Dumas and Stas of the French Academy of Sciences have, together, performed fourteen experiments relative to the atomic weight of carbon; the results all agree, and were obtained either by the combustion of pure charcoal or of highly carbonated and well-known substances. The combustion was performed in oxygen, and care was taken to dry the gases obtained either by sulphuric acid or chloride of calcium. Thus dried, they were passed through two pieces of apparatus filled with solution of potash, and a third filled with potash in powder. The increased weight of the solutions and dry potash gave the weight of the carbonic acid obtained. Thus the weight of the carbon burnt, and of the carbonic acid gas obtained, were known; and from these, without any hypothesis, the proportions in which the bodies combine could be deduced. According to M. Berzelius, the proportions are 200 of oxygen to 76·52 of carbon. According to the recent experiments, above-mentioned, by MM. Dumas and Stas, the result will be very different, for they gave by the combustion of naphthalin, four experiments, 75·21, 75·01, 75·08, 75·07; by the combustion of camphor, three experiments, 75·1, 75·1, 75·0; by the combustion of benzoic acid, two experiments, 75·09, 75·03; by that of the native graphite of Ceylon, three experiments, 74·91, 75·05, 74·99; by artificial graphite extracted from an iron which contained most of it, two experiments, 74·87, 74·90. "All these numbers," M. Dumas remarks, "agree in showing that the true atomic weight of carbon is 75, and not 76·52. There is, consequently, an error in the indispensable elements in fixing the formulæ now employed in organic chemistry. That is to say, there will be many formulæ to modify, many analyses to repeat, especially of those substances which are rich in carbon, in which very considerable errors may have been committed."

M. Dumas adds, that the Academy will remark with interest, that this long and laborious series of experiments has brought us to the atomic weight indicated by Dr. Prout, who had long supposed that the atomic weight of charcoal was exactly equal to six times that of hydrogen, or $12{\cdot}5 \times 6 = 75$, which is the number given by the mean of our results. If, as believed by Dr. Prout, and as now appears very probable, all atomic weights are multiples of that of hydrogen by whole numbers, there will be many things to rectify in the atomic weights at present adopted. Future experiments will decide this point, but it is evident that they must be submitted to a serious verification.

"The Academy," continues M. Dumas, "will remark also with interest, that the atomic weight of carbon which results from these experiments agrees much better than the former with the old analyses of Iceland spar, arragonite and marble, made by Thenard and Biot, as well as with the densities of oxygen and carbonic acid, determined either by MM. Biot and Arago, or by M. de Saussure, whose results also approximate to ours with regard to the combustion of charcoal."

M. Boussingault has communicated some analyses of bitumen, which entirely agree with our results."—*L'Institut*, No. 347.

AFFAIRS OF THE UNITED STATES BANK.

The last arrival from New York has revived in the city the discussion on the prospects of the "United States" Bank, and particular as to a return to cash payments in January, without which a forfeiture of the charter will be incurred. At present, though very sanguine expectations are indulged in by the friends of the institution, such resumption is by no means certain. What may serve to retard it is a reported disagreement among the directors, since the introduction of new members into the board, on the subject of the great cotton speculations of the bank, a fact which is positively stated in private letters, and which, if the accounts are disputed, cannot be otherwise than embarrassing to all parties. Another of the impediments to a resumption is, that no exhibit of the affairs of the bank at all calculated to inspire confidence appears yet to have been made, even to those other banks in Philadelphia, Boston, and elsewhere, from whom loans have been solicited, and expressly declared to be in aid of the proposed resumption. According to the *Journal of Commerce*, the most favorable view of the situation of the "United States" Bank may be thus put:—

"The United States Bank owes the local banks of Philadelphia, 2,500,000 in balance on book, and they hold her bills for about as much more. It is stated that there are 6,000,000, of specie in Philadelphia. Mr. Jaudon has gone to Europe, where he says he can raise all the money that is wanted; and he declared to the officers of the Wall-street banks, before he went away, that the United States Bank had no need of help at all; and that if he had the ordering of affairs he would have asked and taken none. Philadelphia owes Boston 1,500,000, which Boston proposes to loan; and she owes New York, brokers and other monied men, not the banks, the 1,000,000 which is asked here; so that, in fact, no money is to be taken from either city, and the operation will only be to change balances which now lie on demand without interest, and which cannot well be collected, into debts payable at certain fixed periods with interest. The circulation of the United States Bank is said to be about 3,000,000. She has considerable specie to match this. Well, then, say the friends of the loan, if all this is so, to make the loan can do no harm, and there is reason to expect that the resumption will be permanent."

The same journal, in further discussing this subject, strongly deprecates the at least possible danger of a resumption in January and a break-down afterwards, which would be far worse to the banking interest generally than allowing matters to remain as they are now, when the worst that can happen is known. On this point the *Journal of Commerce* says—

"Resumption in Philadelphia is a matter deeply interesting to the whole country. Resumption throughout the south hangs upon it, the collection of balances due to the east hangs upon it, the business of the whole country feels its importance. It is exceedingly desirable that Philadelphia should resume. But to constitute a desirable resumption two ingredients are indispensable:—

"1. The resumption must be permanent.

"2. The whole country must have full confidence that it will be permanent.

"As the matter now stands, it possesses public confidence. In other words, the public feel no apprehension of any great change for the worse. There is no tremulous anxiety lest some disastrous event should occur. What we have, we are sure of, be it better or worse. But a resumption not possessing the entire and intelligent confidence of the mercantile community would throw us at once into a state of alarm. It would be lifting a mass just to create the general cry of 'stand from under.' Every merchant's credit would be injured by the change, from one end of the country to the other, especially at the south, or who have large dealings with the south."

Thus the whole question turns upon the sufficiency of the assistance tendered to the "United States" Bank, to enable it to resume and to sustain that resumption afterwards. Another relapse would of course leave no alternative but that of a winding-up and a distribution of such assets as remain. One hope to which parties interested in the concern have clung is that of the adoption of a "national bank" when General Harrison comes into office, and the formation of it out of the remains of this institution, which would at all events have all the requisite machinery at hand for the purpose. But the policy of such a measure is now held to be very doubtful by the most enlightened supporters of that party, and cannot succeed without a great struggle; and if it did, would be too late to save the "United States" Bank. That reliance is therefore totally worthless. But the position of the banks who have tendered their assistance in favor of resumption is a very serious consideration, if they should happen to do so without being properly secured. When once drawn into the vortex, they must continue for their own safety to extend that assistance if required, and the whole ultimately may be brought down together.

If the "United States" Bank should prove unable to resume in January, it will then become an important question whether the other "suspended banks" in Philadelphia can resume without it, and there appears to be tolerably good opinions that they can still resume, whatever becomes of their great rival. Such an issue of the affair would be irretrievable disgrace and ruin to the "United States" Bank.

There is a hope, in case of the worst, that the Legislature may interfere, and extend further the period of suspension, beyond which is to incur the forfeiture of the charter. But this, after so many evasions of the law, and when so many banks in other states have resumed without assistance, can do no good, but must have an injurious effect both on the state of Pennsylvania and the bank thus favored with its especial protection. There can be no time more favorable for a resumption than the present; and if it is not done now, and in a manner to assure its permanence, the English shareholders will abandon all hope of a favorable issue.—*Times.*

PATENTS.—BRITISH AND FOREIGN.

ENGLISH EXPIRED PATENTS.

JOHN COSTIGAN, of Colton, Ireland, civil engineer, *improvements in steam machinery or apparatus*, Dec. 13.

PETER MACKAY, of Great Union-street, Borough, gent., *improvements by which the names of streets and other inscriptions are rendered more durable and conspicuous*, (being a communication), Dec. 13.

WILLIAM JOHNSON, of Droitwich, gentleman, *improvements in the mode or process and form of apparatus for the manufacture of salt, and for other purposes*, Dec. 18.

MAURICE DE JOUNGH, of Warrington, cotton spinner, *improvements in machinery or apparatus for preparing, roving, spinning, twisting, and winding fibrous substances*, Dec. 18.

CHARLES HARSLEBEN, Esq., of Great Ormond-street, *improvements in constructing or building ships, and other vessels, applicable to various useful purposes, and in machinery for propelling the same*, Dec. 20.

THOMAS QUARRILL, of Peter's-hill, Doctors' Commons, lamp manufacturer, *improvements in the manufacture of lamps*, Dec. 20.

WILLIAM KINGSTON, mill-wright, and GEORGE STEBBING, mathematical instrument-maker, both of Portsmouth, *improvements in instruments or apparatus for the more readily or certainly ascertaining the trim and stability of ships or other vessels*, Dec. 20.

MELVIL WILSON, of Warnford court, Throgmorton-street, *improvements in machinery for cleaning rice* (being a communication), Dec. 20.

CHARLES SEIDLER, of Crawford-street, Portman-square, *a method of drawing water out of mines, wells, pits, and other places* (being a communication), Dec. 20.

FREDERICK ANDREWS, of Stamford Rivers, Essex, *improvements in the construction of carriages, and in the engines or machinery to propel the same, to be operated upon by steam or other suitable power, which engines or machinery are also applicable to other purposes*, Dec. 20.

CHARLES RANDOM, Baron de Berenger, of Kentish-town, *improvements in gunpowder flasks, powder horns, or other utensils of different shapes, such as are used or can be used for the purpose of carrying gunpowder therein, in order to load therefrom guns, pistols, blunderbusses, and other fire-arms*, Dec. 20.

SPECIFICATIONS OF ENGLISH PATENTS.

ENTERED AT THE ENROLLMENT OFFICE.

(*Continued from page* 372.)

CHRISTOPHER NICKELS, of York-road, Lambeth, gent., *improvements in the manufacture of braids and plats*, Dec. 9.—Claim first.—Mode of making braids and plaits with fringed edges or parts, by means of maundrills.

Claim second.—Mode of manufacturing braids and plaits by so arranging the parts of the machines that the threads may work in sets, and the portions of the fabric produced by the several sets of threads are combined, without the threads passing from selvage to selvage, of a flat fabric, or without performing a continuous circle, when working in a circular machine.

The first part of these improvements is performed by applying a maundril or maundrils to the axes of the revolving heads, in such a manner as to form looped or fringed edges or parts to the fabric produced. These maundrils are stationary: and in the fabrics produced by these machines the braiding threads pass round the maundrils in their evolutions and are laid thereon; and as the work is produced and carried up, it is drawn off these maundrils; so that whilst some of the braiding threads are continually working to produce close braided or plaited fabrics, the others are forming looped or fringed edges thereto. The second part of these improvements relates to combining the single braids or plaits so as to form one fabric. Each strip as it leaves the machine will form one complete braid or plait, and this part of these improvements consists in such an arrangement of the machinery as shall cause each set of threads to pass into or work with its next or neighboring set, and thereby produce one fabric of close or braided or plaited material.

ALEXANDER SOUTHWOOD STOCKER, of Birmingham, *improvements in the manufacture of tubes for gas and other purposes*, Dec. 9.—Claim first.—Mode of constructing tubes without seams, made of a compound of copper and zinc, with or without tin, by elongating a bored or cast cylinder, when in a heated state.

Claim second.—Mode of producing iron tubes without seams, by elongating cylinders made of malleable cast iron.

The inventor states that the combination of metals which he uses, and which is found to answer well, is sixty pounds of the best selected copper to forty pounds of zinc; to every 100 pounds of this may be added fourteen ounces of tin, which will make the metal harder. The combination may however be made of different proportions, but the quantity of either should not be such as to prevent the whole from being rolled when heated to redness.

The cylinders are cast short, and of a thickness depending on the desired length and substance of the tube to be formed. The aperture is formed in the cylinder by means of a sand or other core, and of the same size as the aperture of the finished tube is to be. A maundril is formed of the proper size, and nearly parallel, *i. e.* tapering one-sixteenth of an inch in eight feet. The cylinder is heated to a low red heat, or "cherry red in the dark." The maundril is then inserted, and the whole passed between a pair of grooved rollers, and this process is repeated (heating the metal every time) by passing the tube through rollers gradually decreasing in size, until the tube is sufficiently elongated.

The second part of these improvements is performed in the same manner, only instead of the metal being a kind of poor brass as in the former case, simple cast iron is used. The cylinders after being cast are placed in a proper chamber and surrounded with rich iron ore, the chamber is then closed and heated to a bright red for about eight days (or for a longer time if the cylinders are extra thick), in order to make them sufficiently malleable, when they are passed between grooved rollers, in the manner already described.

ROBERT HAMPSON, of Mayfield Print-works, Manchester, calico printer, *improved method of block printing on woven fabrics of cotton, linen, silk, or woollen, or any two or more of them intermixed*, Dec. 9.—It would be necessary to give drawings for a clear comprehension of an abstract to this specification; we will therefore confine ourselves to the claims, which will in a great measure exemplify the nature of these improvements.

Claim first.—Mode of printing with blocks on woven fabrics of cotton, linen, woollen, or any two or more of them intermixed.

Claim second.—Combination of contrivances and agents whereby the printing block is caused to descend in a perpendicular direction, with its face parallel to the printing table, in order that it may take up the proper color from the sieve or sieves, and then impress it on the fabric to be printed.

Claim third.—The same combination of contrivances or agents, however modified or altered in size, form, or proportion, yet producing the above effect.

Claim fourth.—Such coloring apparatus in which several sieves are separated and held apart to admit of the separate colors being spread on them, and afterwards closed or brought into juxta-position, in order to print the desired pattern composed of different colors at the same time.

Claim fifth.—The coloring apparatus either used in connection with the other machinery or by itself.

SAMUEL WAGSTAFF SMITH, of Leamington, iron-founder, *improvements in apparatus for supplying and consuming gas*, Dec. 9.—Claim. Mode of constructing and applying an apparatus to gas burners, by means of which the gas is supplied in a heated state thereto, and consumed thereby, such heating being caused by the flames of such burners.

For the ordinary argand burner, the supply pipe terminates at a hollow ring placed above the flame, and in such a position as to be heated by it. From this ring a tube communicates to the burner, the gas passes from the supply pipe, and traverses the heated hollow ring or circle, and then descends to the burner to be consumed in its heated state. For a bat's wing burner, a hollow oval shape would be preferable to a circle, and many other shapes might be used for various burners; therefore the inventor of these improvements does not confine himself to the particular form of apparatus described, but claims any that will supply the gas to the burner in a heated state, by which means, he observes, a much better light is obtained from a smaller quantity of gas than is at present used.

JOHN GEORGE SHUTTLEWORTH, of Fearnley-place, Glossop-road, Sheffield, *certain improvements in railway and other propulsion*, Dec. 9.—Claim first.—The application of the power of a column or body of water, contained in a tube, and acting against a piston, to which piston the carriage to be propelled is fastened.

Claim second.—The improved guide neck to the piston, for the purpose of raising and applying to its proper place the flexible valve or stuffing, to fill the slot or space left in the upper part of the tube for the passage of the plate.

A tube with an opening along the top is placed under the centre of the carriages, or between the rails of the railway. At the bottom of this tube is deposited a continued baird of flexible stuffing; the tube also contains a piston, to which is adapted a guide neck with a dove-tailed opening, the narrowest part of which opening corresponds with the slot in the top of the tube. The carriages are connected to the piston by means of a metal plate, which passes through the slot in the tube. The power is obtained by either forcing water by means of steam into the horizontal tube, or by the pressure of a column of water, at one end flowing into the same, the flow being commanded by an appropriate valve in the upright tube containing the column of water.

The carriages are propelled by the water acting against the piston, which as it moves forward causes the guide neck to raise the flexible stuffing from the bottom to the top of the tube, for the purpose of filling the slot and rendering the tube water-tight behind the train or carriages.

FRANCIS GREAVES, of Radford-street, Sheffield, *improvements in the manufacture of knives and forks*, Dec. 11.—Claim.—The detached bolster with a thick metal upper socket, and a thin metal under socket, for the purpose of fastening the upper to the blades of knives and forks by either soldering or riveting, and the under to the handles by being pressed into a groove, or over a rim formed for that purpose.

The metal bolster, which may be made of any design, has a stout upper socket which has a traneverse slit for the purpose of receiving the bottom part of the blades of knives, or having a countersunk hole to receive the same part of the forks, which are first firmly fixed thereto; the tang (which in both cases passes through the bolster) is then inserted in the handle and cemented by means of resin, or in any other convenient way. A thin metal socket which has been formed on the under part of the bolster is then either turned over a rim left on the handle for the purpose, or pressed into a groove which may be made in the upper part of the handle, if preferred to the rim.

NOTICE TO PATENTEES.

The following are the names of patentees whose specifications will be published in the "INVENTORS' ADVOCATE" on the 20th of February.

John Joseph Mechi, of Leadenhall-street, cutler due Jan. 7.

Thomas William Parkin and Elisha Wilde, of Portland-street, Liverpool, due Jan. 12.

Peter Fairbairn, of Leeds, engineer, due Jan. 13.

Thomas Tassel Grant, of Gosport, due Jan. 13.

Edwin Travis, of Shaw Mills, near Oldham, due Jan. 15.

John Lambert, of Coventry street, due Jan. 15.

Baron Charles Wetterstedth, of Limehouse, due Feb. 11.

John Peter Isail Poncy, of Wells-steet, Oxford-street, due Feb. 13.

Miles Berry, of Chancery-lane, due Feb. 14.

James Rogers, of Brewer-street, Somers-town, due Jan. 18.

Pierre Armand, le Comte de Fontainmoreau, of Skinner's-place, Size-lane, due Feb. 15.

John Young, of Wolverhampton, due Feb. 17.

Luke Hebert, of Birmingham, due Feb. 17.

FOREIGN PATENTS.—FRANCE.

(THIRD QUARTER OF 1839.)

By Royal Decree, dated December 18, 1839.

84. Boquillon, N., second addition to patent for 15 years, dated June 20, 1839, for *apparatus for regulating the flow of liquids and of gas, for various means of avoiding the dangers of compressing elastic fluids, as well as for various processes of compressing, particularly adapted to lighting by portable gas*, Aug. 22, 1839.

85. Bouvard, A., 5 years, for *a new umbrella walking stick*, Aug. 22, 1839.

86. Buros, J., 10 years, for *revolving axle-trees, and carriages hung on springs*, Aug. 22, 1839.

87. Dubèe, C., 5 years, for *a moveable composing-stick, with apparatus for ruling lines*, Aug. 22, 1839.

88. Duval, J. J., 10 years, for *an apparatus for baths, douches, fumigations, &c. of dry or humid steam*, Aug. 22, 1839.

89. Levanchy, J. B., 10 years, for *a portable folding-bridge, with grooves and rollers*, Aug. 22, 1839.

90. Mahiet, C., 5 years, for *a new piston gun and new cartridge*, Aug. 22, 1839.

91. Marchal, J. A., 5 years, for *a new machine for boring iron*, Aug. 22, 1839.

92. Periaux, T. G. A., second addition to patent for 10 years, dated July 31, 1838, for *obtaining continuous impressions, by arranging for this purpose machines for making endless paper*, Aug. 22, 1839.

93. Apostoly, H. C. and J. A., 5 years, for *a new regulator for distributing paper pulp evenly over the screen*, Aug. 26, 1839.

94. Astorquisa, B., 5 years, for *the application of slate instead of wood to billiard tables*, Aug. 26, 1839.

95. Carletti, L., 15 years, for *a machine for transmitting and increasing motive power, applicable to carriages, steam-engines, &c.*, Aug. 26, 1839.

96. Lyon, Cremieux, 5 years, for *a machine for unravelling woollen rags not fulled, and for rendering them fit to be remanufactured*, Aug. 26, 1839.

97. Guilbert Danelle, F. C., 5 years, for *a process of inlaying in furniture designs and ornaments in porcelain, crystal, &c.*, Aug. 26, 1839.

98. Hutinet, E., and Capitain, R., represented by Cruzel, 5 years, for *cast iron grates*, Aug. 26, 1839.

99. Liévin, L., 10 years, for *a process of making bread without yeast*, Aug. 26, 1839.

100. Puget, L., second addition to patent for 5 years, dated Dec. 10, 1836, for *new combs to supersede hair-pins*, Aug. 26, 1839.

101. Réallier Brepols de Saint Peray, and Desfossés, A., represented by DecoekWatrelos, 15 years, for *silvering without pressure window glass for common looking-glasses*, Aug. 26, 1839.

102. Truffaut, L. H. J., 10 years, for *new combination of machinery for turning objects*, Aug. 26, 1839.

103. Vallod, J., 15 years, for *an apparatus for washing, drying, and preserving grain*, Aug. 26, 1839.

104. Barbeau, L., addition to patent for 5 years, dated May 27, 1839, for *a complete system of making coke and purified charcoal, and of distilling from coal-smoke sal-ammonia and essence of tar, and of extracting from wood the pyroligneous acid, together with essence of tar*, Aug. 30, 1839.

105. De Bormard, A. C., third addition to patent for 15 years, dated March 28, 1837, for *a moveable permanent portable cupping glass*, Aug. 30, 1839.

106. Charpentier, P. J., 10 years, for *a new system of extracting sugar from beet-root*, Aug. 30, 1839.

107. Colson, D. J., 15 years, for *a new alloy applicable to making types*, Aug. 30, 1839.

108. Constant, J. B. J., 10 years, for *axle-trees with three wheels applicable to every description of carriages*, Aug. 30, 1839.

109. Couvers, C., and Boudstot, A. A., 5 years, for *applying the principle of the reaction of liquid and fluid movers to rotary engines without centrifugal force*, Aug. 30, 1839.

110. Delarothière, J. A., 10 years, for *the manufacture of a new tissue elastic in one way only*, Aug. 30, 1839.

111. Feuillet, L. F., 5 years, for *a mechanical press applicable to typography*, Aug. 30, 1839.

112. Heuzé, E., addition to patent for 15 years, dated Aug. 8, 1838, for *a process of transforming fecula into white pulverulent manure*, Aug. 30, 1839.

113. Lucas Richardière, J. M., 15 years, for *applying to hydraulic turbines the ebb and flow of the sea*, Aug. 30, 1839.

114. Passot, F., 15 years, for *a new means of turning to account the pressure of fluids*, Aug. 30, 1839.

115. Ajasson de Grandsagne, J. B. F. E., addition to patent for 5 years, dated Nov. 14, 1838, for *improvements in making plaster, and in revivifying old plaster*, Sept. 5, 1839.

116. Combes, C. P. M., second addition to patent for 15 years, dated Aug. 24, 1838, *for a machine of centrifugal force for displacing liquids and aeriform fluids, for communicating motion to them, and for turning to account the motive power of air and water*, Sept. 5, 1839.

117. Davies, J., represented by Perpigna, 10 years, for *improvements in the manner of consuming smoke and of saving fuel in steam-engine and other furnaces*, Sept. 5, 1839.

118. Debrinay Boiffard, B., 5 years, for *a prompt exact cut of boots and shoes*, Sept. 5, 1839.

119. Humfreys, E., represented by Perpigna, 10 years, for *improvements in regulating the supply of gas and in attaching the glasses to the gas burners*, Sept. 5, 1839.

120. Jules Mareschal and Co., third addition to patent for 15 years, dated March 31, 1838, for *the manner of arranging filtering substances, and for means of retaining them in the filters under high pressure*, Sept. 5, 1839.

121. Neuburger, A., 10 years, for *a clock movement*, Sept. 5, 1839.

122. James Perry and Co., represented by Perpigna, addition to patent for 15 years, dated July 31, 1839, for *improvements in inkstands and in substances for sealing letters*, Sept. 5, 1839.

123. Peugeot, Brothers, 15 years, for *manufacturing saw blades by means of rolling*, Sept. 5, 1839.

124. Pickstone Dobrée, W., represented by Perpigna, 15 years, for *a process of changing the alternating rectilinear motion into a rotary one*, Sept. 5, 1839.

125. Baron de Suarce, represented by Perpigna, 15 years, for *an improved process of obtaining extracts from animal and vegetable substances, applicable to extracting colors, tanning matter, essential oils, &c.*, Aug. 5, 1839.

126. Barthélémy, F., 15 years, for *means of hastening combustion and of developing caloric, and at the same time of saving fuel*, Sept. 9, 1839.

127. Chemery and Parpète, 5 years, for *a machine called découpoir, for making zinc loops*, Sept. 9, 1839.

128. Fourneyron, P., represented by Perpigna, 15 years, for *improvements in machines or apparatus for carding, drawing, and spinning cotton, flax, silk, and other fibrous substances*, Sept 9, 1839.

129. Gerbet, A. J., 5 years, for *a new terracing wagon*, Sept. 9, 1839.

130. Huré, C. F., 5 years, for *silk buttons with flexible silk shank*, Sept 9, 1839.

131. Léonard, L. J., represented by Guilmard, 5 years, for *a new process of drawing out window glass*, Sept. 9, 1839.

132. Letestu, J. M., 5 years, for *a new picture frame*, Sept. 9, 1839.

133. Machard, P., addition to patent for 15 years' dated Feb. 3, 1834, for *processes of manufacturing and purifying rosin oils, so as to render them applicable to lighting purposes, to the manufacture of soap, &c.*, Sept. 9, 1839.

134. Martinet Boulard, L. L., 5 years, for *a new vegetable blacking*, Sept. 9, 1839.

135. Rousseau, E., 10 years, for *a method of manufacturing sulphuric acid from sulphurous acid by the joint action of air and steam*, Sept. 9, 1839.

136. John, J., represented by Truffaut, 5 years for *processes of making certain pipes*, Sept. 9, 1839.

137. Catez, C. F. J., addition to patent for 10 years, dated June 26, 1839, for *a lamp at a constant level*, Sept. 12, 1839.

138. Feuillet, L. F., 15 years, for *a machine for casting types*, Sept. 12, 1839.

139. Llorens, J., 15 years, for *a new system of rapid navigation without the use of fire*, Sept. 12, 1839.

140. Reboul, J. F. H., 10 years, for *the composition of a grey soap*, Sept. 12, 1839.

141. Barthélémy, F., addition to patent for 15 years, dated Sept. 9, 1839, for *means of hastening combustion and of developing caloric, and at the same time of saving fuel*, Sept. 19, 1839.

142. Berend, S. S., represented by Truffaut, 15 years, for *improvements in processes of extracting soda from hydrochlorate of soda (rock salt)*, Sept. 19, 1839.

143. Bevière, J. B., addition to patent for 10 years, dated July 22, 1837, for *a new stove*, Sept. 19, 1839.

144. Boquillon, N., third addition to patent for 15 years, dated June 20, 1839, for *a system of apparatus and processes for regulating the flow of gas and liquids under pressure, for avoiding the dangers arising from the compression of elastic fluids, also for compressing, particularly applicable to lighting by portable gas*, Sept. 19, 1839.

145. Bucquet, J., 5 years, for *a machine for hashing meat and other fat bodies*, Sept. 19, 1839.

146. Coulon, J., represented by Truffaut, 3 years, for *a new gridiron for broiling meat or fish without smoke or smell*, Sept. 19, 1839.

147. Dupont and Dreyfus, 15 years, for *a system of torrefying wood in forests*, Sept. 19, 1839.

148. Faucon, J., 5 years, for *an hydraulic machine with forcing pump for raising water*, Sept. 19, 1839.

149. Faublin de Banville, 10 years, for *an inclined umbrella*, Sept. 19, 1839.

150. Ferdinand, G., 5 years, for *suspension pincers (pinces)*, Sept. 19, 1839.

151. De Fresne, E. L. J. E., 15 years, for *an atmospheric mover for guiding aeronauts, applicable to navigation*, Sept. 19, 1839.

152. George, J., second addition to patent for 10 years, dated May 20, 1834, for *a motive power obtained from man's muscular strength and weight*, Sept. 19, 1839.

153. Gibus, A., second addition to patent for 10 years, dated Dec. 9, 1837, for *mechanical hats*, Sept. 19, 1839.

154. Lamb, R., represented by Truffaut, 10 years, for *the composition, preparation and use of a new combustible substance*, Sept. 19, 1839.

155. De Mory, E. A., 10 years, for *improvements in windows, doors, and frames*, Sept. 19, 1839.

156. Roumestant, V. N. H., represented by Perpigna, 5 years, for *improved ledges*, Sept. 19, 1839.

157. Wood, H. W., represented by Soulas, addition to patent for 15 years, dated July 10, 1839, for *a new prompt economical method of making white lead*, Sept. 19, 1839.

158. Carpentier, J. F., and Duboc, M. A., addition to patent for 5 years, dated Dec. 27, 1838, for *a new horse collar*, Sept. 24, 1839.

159. Dalmont, P. M., 10 years, for *an apparatus for separating solid from liquid matters, and for disinfecting the solid substance by means of lime, ashes, &c.*, Sept. 24, 1839.

160. Davoust, P. F., and Lèvêque, D., 10 years, for *a primer for piston guns*, Sept. 24, 1839.

161. Demay, H. E., Morsaline, V. J., and Mme. Vignaux, M. D., 5 years, for *a new shoe called sabottine*, Sept. 24, 1839.

162. Despréaux, A. A., 15 years, for *a new imitation of stuffs woven à la Jacquard*, Sept. 24, 1839.

163. Goin, E., 15 years, for *a mechanical cork*, Sept. 24, 1839.

164. Jullien, A., 5 years, for *machinery for making waterproof felt or other caps*, Sept. 24, 1839.

165. Mudesse, J. M., 10 years, for *incrusting marble in wood*, Sept. 24, 1839.

166. Pape, H., fifth addition to patent for 15 years, dated Aug. 23, 1837, for *new mechanism for pianos and a new arrangement of the sounding board*, Sept. 24, 1839.

167. Joumsin, J. L., 5 years, for *improvements in brass weights*, Sept. 24, 1839.

168. Vincent, J. H., addition to patent for 5 years, dated July 8, 1839, for *new apparatus for manufacturing hydrogen gas*, Sept. 24, 1839.

169. Wiss, C. F., represented by Perpigna, 5 years, for *improvements in spatterdashes and buskins*, Sept. 24, 1839.

170. Aynard, A., Pinchon, A., Laurent, J. B., and Denvelle d'Heronville, J. S., 15 years, for *simple economical proccsses to be substituted for indigo*, Sept. 26, 1839.

171. Banquet, A. J. B., 5 years, for *a new drill plough*, Sept. 26, 1839.

172. Carron, P. J., 5 years, for *a new progressive and diminishing movement*, Sept. 26, 1839.

173. Delmenique, P., 10 years, for *baking tiles and bricks by means of anthracite*, Sept. 26, 1839.

174. Maillier, P., 10 years, for *an instrument for taking the exact measure of the human body*, Sept. 26, 1839.

175. Marochetti, P. C. J. B., 15 years, for *an apparatus for baking plaster*, Sept. 26, 1839.

176. Roussillon, J., 5 years, for *a portable machine for threshing wheat*, Sept. 26, 1839.

177. Ardisson, A., 10 years, for *means of reproducing on wood all that sculpture can produce*, Sept. 30, 1839.

178. Delarothière, J. A., 10 years, for *a new kind of knitting, and its application to objects without seam*, Sept. 30, 1839.

179. Esprit, J., 5 years, for *improvements in weaving silk stuffs, such as taffetas lustrés, satins, &c.*, Sept. 30, 1839.

180. Heruville, J. M., addition to patent for 5 years, dated March 16, 1838, for *a machine for printing calicoes, stuffs, paper, &c.*, Sept. 30, 1839.

181. Meigret, H. C. A., 10 years, for *orens for baking plaster*, Sept. 30, 1839.

182. Olivier, E. A., 15 years, for *a new horizontal hydraulic wheel*, Sept. 30, 1839.

183. Puval, Brothers, 15 years, for *a machine for reducing dye woods to powder*, Sept. 30, 1839.

184. Soultzener and Co., addition to patent for 15 years, dated Sept. 5, 1838, for *a new system of inlaying in relief*, Sept. 30, 1839.

(END OF THIRD QUARTER).

FOREIGN INTELLIGENCE.

BELGIUM.

By a recent royal decree for regulating the laws by which literary property and works of art are held, it is ordained that a copy of every printed work, which is deposited at the royal library for the purpose of maintaining the copyright, shall be kept in a certain part of the library appropriated for works protected by copyright. Each work so deposited is to have the signature of the author, and it is not to be taken from the shelf where placed, except by special order, until the expiration of the copyright, when it is to be entered and placed among the other books in the library.

The coal mines, under the commune of Temploux, have been granted, by a royal decree, to a private company, under certain conditions. The coal beds have a superficial extent of 294 hectares.

It is in contemplation to establish a steam-boat communication between Antwerp and Havre.

The rain, wind, and snow have greatly injured the model of the statue of Rubens, which was recently inaugurated at Antwerp with much pomp and festivity. The statue is not yet ready, and these injuries from the weather, it is feared, will destroy the plaster model before the more durable work of the artist can be completed.

It is stated in several of the Brussels papers, that the Government intends to form a medical establishment, for the benefit of the persons employed on the railways. As all the Belgian railroads branch out from one centre, the medical corps need not be very numerous, as the carriages will convey them to visit their patients at the most remote stations, and bring them back within a few hours; even supposing that they do not adopt the plan of erecting an hospital at the central station of Malines. The Dutch Government has already a medical establishment of this kind, in which not only the persons employed on the railroads, but the members of their families, are attended to at the expense of the administration; and also the travellers who are taken ill or meet with accidents on the road.

Baron Stassart has made some useful statements to Government relative to the coal mines in Belgium. It appears that the trade of Belgium with the port of Genoa may easily be extended. Coal in particular is likely to be much in request, in consequence of the consumption of the steam-boats, of which the number daily increases, (at present there are 17, and in 6 months there will be 25), and by the use of gas. Besides this, a railroad is projected between Genoa and Turin. If it should be put in execution, the demand for coal will be still greater. Coal is now exclusively furnished to Genoa by the English; the best quality of Newcastle coal is sold on ship-board (the expense of landing and the tax on consumption to be defrayed by the purchaser) at 33 f. a ton, of about 1,000 kilogrammes, navigation duties included. These duties are a little higher to the English than to Belgians, as the British flag is not--like that of Belgium—only liable to the same dues as the national one. The difference is nearly one frank in the ton.

M. Lemielle, the inventor of a safety-lamp for coal mines, has been authorised by the Belgian Government to introduce this lamp in collieries in that country, that the commission may be enabled to compare it with the lamps invented by M. Mueseler, and to judge from experiment which of the two is best adapted to the purpose. The company of Selessin have recently ordered that the safety-lamp of M. Lemielle should be used in their coal mines, the trials that have been made of it having been most satisfactory. The commissioners appointed for the examination of the safety-lamps have acknowledged in their report to the Minister of Public Works, that the inventor of this lamp has remedied the principal defects of Davy's lamp; that he has employed ingenious methods of accomplishing this; that it is remarkably solid, pleasant, and easy to use; and that it emits a light which may be estimated to exceed that of Sir Humphrey Davy's by one and a half. The price of this lamp is only 4f. 50c., and it has the particular advantage of affording every requisite security even in case the glass chimney were to burst or to break by any of those accidents to which it might be exposed in the explosion of coal mines.

RAILWAY INTELLIGENCE.
DOMESTIC AND FOREIGN.

On Monday last Lieut.-Colonel Sir Frederick Smith, accompanied by Mr. Laing, of the Board of Trade, made a formal inspection of 17 miles of new line on the Great Western Railway—namely, from Faringdon road to Wootton Bassett road. We understand that the report of Sir Frederick is favorable, and that the opening will take place early in the ensuing week, thus completing 80 miles of the railway communication towards Bath.— *Railway Times.*

Sunderland and Durham Railway.—On Tuesday last, another adjourned meeting of this company took place, in the Arcade, Sunderland, at which it was announced that the shareholders' loans then amounted to near £32,000. A long conversation took place on the point, whether the directors should proceed with the plan laid down for relieving the company, when the loan reached £35,000, or £40,000. The question was at length decided in favor of going on with the smaller sum. —*Tyne Mercury.*

The Stockton and Hartlepool Railway will be opened for passengers in the course of a very short time; and, as the Great North of England Railway will be opened early in the ensuing year, there will be a continuous line of railway communication from these towns, and also from Newcastle, &c., to York, and forward to Leeds, Manchester, Birmingham, and London.—*Newcastle Journal.*

New Code of Signals on the Great Western Railway.—The whole of the engine-drivers, stokers, guards, conductors, and other persons employed on the railway throughout the line were assembled at the engine-house of the Paddington station last week, when a new code of signals, prepared by Mr. Brunel, the engineer-in-chief to the company, were fully explained to them by that gentleman, and several of the signals were put into practical operation. A special train was sent from the Paddington to the Faringdon-road station, to convey the engineers, stokers, guards, &c., at that end of the line to town. By the adoption of the new code, distinct and immediate intimation will be given to the engine-drivers and others of the least obstruction along the line.

Edinburgh and Glasgow Railway.—It is quite pleasing to witness the rapid progress making with the great contract at the head of Queen-street. The rock whereon the old road betwixt the High Church and Partick was founded is fast disappearing, and when that is entirely removed, the mouth of the tunnel, which is rapidly approaching to completion at this end, will be visible from the gateway. The stone sheds for the engines are getting on to a junction with the mouth of the tunnel, in a circular form on one side, and we suppose it is intended to carry them round on the other in the same way. From present appearances, we make no doubt that this section of the great work will be completed by the period spoken of, namely, August next.—*Glasgow Argus.*

One of the railway journals states that it is in immediate contemplation to form a Board to supervise railways, and that Mr. Porter, of the statistical department at the Board of Trade, is to be a member. We believe there is to be no Board at all, but that the present intention is to add an Inspector to the office of the Board of Trade, who shall, with Mr. Porter, conduct the business under Lord Seymour's Act.—*Courier.*

RAILWAY ACCIDENTS.

Deodand of Two Thousand Pounds.—We understand that ever since the conclusion of the inquest on the two men who were killed by the late collision on the line of the London and Birmingham Railway at Harrow, the solicitors of the railway company, in conjunction with the board of directors, have been busily engaged in preparing the documents necessary on which to found an application to the Court of Queen's Bench, to set aside the coroner's inquisition, on the ground that the deodand of 2,000*l.* is an excessive one, and that the verdict is not borne out by the evidence adduced.—*Observer.*

Danger of Trespassing on Railways.—On Tuesday morning, about eleven o'clock, as a young man named Galt was crossing the Croydon Railway, near the New-cross station, he was knocked down by the tender of the up-train, and received such a severe compression of the brain that he is not expected to recover.

Conviction of an Engine-driver.—On Tuesday David Fletcher, an engine-driver in the employ of the Liverpool and Manchester Railway Company, was, by order of the directors, brought before one of the county magistrates, charged with disobeying the regulations of the company in reference to the locomotive engine entrusted to his care, and, the offence being proved, the magistrate convicted the

prisoner in the mitigated penalty of five pounds, or, in default of payment, to be imprisoned in Kirkdale Gaol for one calendar month.—*Liverpool Albion.*

Effect of a Fall from a Railway Train.—On Tuesday evening John Crow, twenty-one years of age, who was fireman to an engine on the Southampton railway, was shooting some coke from the sack in which it is stowed in the tender, when he overbalanced himself, and, from the velocity with which the train was travelling, he was thrown with great violence on the side of the railway. The engine-driver stopped the engine and sent a man back to look after Crow, when he found him lying on his back in great agony. He was taken to the Winchfield station, and it was ascertained that his collar-bone was broken and the spine of his back dreadfully injured, besides being otherwise severely bruised. It is fortunate he was thrown off the rail, or the train must have passed over his body.

A Woman beheaded on the Portreath and Redruth Railway.—On Friday evening last, as Betsy Angove was proceeding from Pool to her residence, imprudently choosing to walk by the railway, which shortens the distance, she was overtaken by one of the trains proceeding to Portreath; and being thrown down with her neck on one of the rails, her head was instantly severed from her body. An inquest has been held on the body, and a verdict of accidental death returned.—*Plymouth Journal.*

Ardrossan Railway Accident..—On Wednesday morning, as the Ardrossan locomotive train was proceeding to Kilwinning to meet the train from Glasgow, when near Stevenston Quarry, the engine and tender went off the rails, and by their great velocity were embedded in the earth to the depth of several feet. None of the carriages were overturned, and none of the passengers injured, the engineer having had time to turn off the steam just as the engine deviated from the line.—*Kilmarnock Journal.*

FOREIGN RAILWAYS.

The works on the railway from Mons to the French frontier, have been commenced with vigour. The workmen commenced on that part of the line between Bonssun and Quievrain on the 30th ult., and it is expected that the road will be finished by the time prescribed, which is 18 months from the date of commencement.

Railroad from Paris to Belgium.—Late accounts from Valenciennes state that the portion of the iron railroad from Valenciennes to the frontier of Belgium is laid down as far as Quievrain, the point of junction. The furrows of a ploughshare mark out the line, as well as the land on each side to be appropriated. No engineering difficulties have occurred on this portion of the road. The embankments in the marshes will not be more than two metres high. There is only one bridge to be thrown over the Scheldt, and some pontoons over the dried-up streams of the marshes. Should nothing occur to prevent the progress of the works, they may be finished with ease during next season. They are at present engaged in laying out the entrance into the town, by the fortification of the port of Lille, and are placing scaffolding to those houses on the Esplanade which are to be taken down. From this it is evident that Government does not lose any time. It is stated that the engineers are also occupied in reviewing the different plans of road for the junction from Brussels to Paris, in order that the whole may soon be completed. The *Journal des Debats* observes, in reference to the importance of this railroad as a military communication: "If there is no railroad from Paris to Lille, the Belgian system of railroads *must become a powerful instrument of offensive warfare*, to be used by Germany against us; with such a railroad, the Belgian system of railroads is for us."

COSTS FOR ATTEMPTING TO PASS A RAILWAY BILL.

In the Court of Queen's Bench on Saturday an action was tried, in which Mr. Beetham, a solicitor, was plaintiff, and the directors of the City Railroad Company were the defendants, for the amount of a bill incurred by that company in an unsuccessful attempt to obtain an Act of Parliament for their railway.

A witness called to prove the work done, stated, that he had been employed to serve the notices required by the standing orders on a bill being brought into Parliament. He was some weeks engaged in this service. He was employed for the space of six weeks. He received £3 a week during that time. There were about 20 other persons employed in the same manner.

Sir W. Follett said, the business for which the plaintiff now sought compensation was for the trouble of preparing and bringing into Parliament a bill to establish a company, which bill had failed. Under such circumstances, it might naturally be expected that the demand would not be very considerable. The bill sent in by the plaintiff amounted, however, to £16,000. A portion had been paid, but a sum of £9,000 was now sought to be recovered. The question, in substance, for the jury to determine was, whether the defendants were liable to this demand, the plaintiff having, as they alleged, agreed to do the work for costs out of pocket, and that even those costs were to be paid from the funds of the company, and that the persons who were the directors were not to be held personally responsible for them. One of the charges alone consisted of £3,000 for the serving of notices. In the first service of notices there was some error, and fresh notices were served, and the whole charge was £7,000.

Several witnesses were called to make out this defence, and to show that it was partly in consequence of the plaintiff's own conduct in allowing persons to sign the deed for nominal shares that the bill did not succeed in parliament.

Lord Denman summed up the case, and expressed a strong opinion against any practice of permitting persons to sign the deed for more shares than they really took, thus apparently giving their countenance to speculations that were in all probability of a ruinous nature. It appeared to him, however, on the evidence, that if in this respect the plaintiff had at all been guilty of what was imputed to him, the directors were themselves equally cognizant of the fact, and could not, therefore, set that up as an answer to his action.

The jury returned a verdict for the plaintiff.

COMPLETION OF THE SUMMIT TUNNEL.

On Wednesday the last brick of the last junction length of that great undertaking, the Summit Tunnel, on the Manchester and Leeds Railway, was keyed in by Barnard Dickinson, Esq., the resident engineer, who was presented with a silver trowel for the purpose—the gift of the inspectors and sub-contractors on the works—by John Stevenson, Esq., contractor. Previous to the appointed hour, the spacious tunnel presented an imposing appearance. Gentlemen of the first respectability, accompanied by numbers of ladies, were seen with lighted torches advancing towards the place to witness the ceremony of the completion of this great work. Precisely at the hour of twelve o'clock at noon, Mr. Stevenson, accompanied by his manager, Mr. George Mould, in company with Mr. Dickinson and several other gentlemen, ascended the platform erected for the occasion. The firing of the cannon being suspended, and the acclamations of the multitude being silenced, Mr. Stevenson addressed Mr. Dickinson, and presented him the trowel, with which he completed the work. Mr. Dickinson, in returning thanks and addressing the company, made the following remarks on the difficulties of railway engineering:—

"Some idea of the quantity of labor requisite for the construction of this tunnel may be obtained by putting it in this manner—suppose it had been possible to execute it by the unassisted efforts of one man, and supposing that one man could have worked as advantageously in proportion to his number as the 800 actually employed have in proportion to their numbers, it would have taken him as much time to complete it as has elapsed between the commencement of the Christian era and the present day, or 1840 years.

"To the ordinary spectator, tunnels present few charms. There is no proud superstructure to please the eye—no splendid vista of columns to delight the imagination; their very existence, like the moles, is only to be traced by the little heaps of dirt they cast up on the surface, and the utmost praise awarded to them is that of being necessary evils—nuisances which must be tolerated; but the practised engineer knows well that they comprise the most difficult branch of his profession; that they are fraught with dangers which defy both experience and calculation—dangers, the more to be dreaded because they are unseen. They resemble the hidden rocks and quicksands of the mariner; he may make shipwreck upon them almost before he is aware of their existence.

"In all railway undertakings, difficulties in a greater or less degree, must be expected. There are hills to be perforated, valleys to be filled up, rivers to desert the course in which they had flowed on peacefully for ages, goodly edifices to rise as it were from the treacherous sands. All these things are natural, and are to be expected; but, in addition to all these, we have had on this line the elements against us—avalanches of earth and torrents of water have opposed our progress; also men, and, I grieve to add, women, as impracticable as the elements by which they are surrounded. But we have now arrived at a great epoch in our history; these things are for the most part conquered. Hitherto we have been advancing like a train in a tunnel, through mist and through darkness; we are now emerging from it into the bright sunshine of prosperity. May that prosperity be great and lasting, and may the company under whose auspices the work has been conducted, reap that rich harvest of success to which they are so well entitled!

"The opening of this railway will, no doubt, occasion a great change in the present channel of communication. The back-bone of England may be said to be broken, its *spinal marrow*, the Summit Tunnel, has been touched. Blackstone Edge thou art no more; the grouse may still feed upon thy heather, the canal company may drain every drop of moisture from thy barren surface to support them in their extremity; but thy inns will be deserted, thy roads will become sheep-walks, no travellers will henceforth toil up thy steep sides, or admire thy rugged beauties."

The Formation of Public Companies in the United States.—The President brought us an amusing specimen of the mode in which Trans-Atlantic speculators attempt to procure capital in this country for the formation of joint-stock companies in the United States. By it we received a letter from a gentleman in New York, of whose existence we had no previous knowledge, informing us of all the preliminary steps he had taken to form one of the most likely companies in that city; how he had obtained the best charter, induced men of the first-rate respectability to join in the direction; how he was determined to have every dollar paid in cash, or bank and state stocks in sound banks, whose stocks are above par; how he could command the best business, and would pay the highest profits; but how unfortunately he could only procure one-half the capital he required in his own country. In this predicament he thought it possible—to use his own words, "we can render each other some mutual assistance, either directly or indirectly;" *we* could draw "the attention of our capitalists to the subject in a few lines;" *he* would be all liberality. "If," said our correspondent, "upon examination of the subject you can, with the aid and influence of your friends, assist Mr. ——, the American consul at ——, in forwarding our views, and carrying out our plans in London, we shall be disposed to pay you the liberal sum or bonus for your time and trouble of 5,000 dollars!" The proposal is certainly liberal as well as characteristic; but it should have been made to a stock-jobber, and not to a journalist in England. We suppose they manage these things better in the States.—*Journal of Commerce.*

THE FLOODS IN THE RHONE.—The *Munich Gazette* remarks that one of the causes of the late flooding of the Saone was the circumstance of the Rhone, which was itself unusually flooded, keeping back the waters of the former river, which on account of its *embouchure* being nearly at right angles to the course of the Saone it would do. In the same way the Durance, which was also greatly above its usual level, and comes into the Rhone at a complete right angle just below Avignon, kept back the waters of that river, and caused the unusually high flood in this city. Similar circumstances have been remarked at the junction of other rivers in various parts of Europe, where high floods have been in the same way occasioned.

GENERAL COMMISSION AND PATENT AGENCY FOR IRELAND.

WE beg to recommend our AGENT for IRELAND, Mr. RICHARD TELFORD, 109, STEPHEN'S GREEN, DUBLIN, as the most eligible person whom PATENTEES can employ for the sale of their articles in Ireland. He has a most extensive and respectable connection, and his house is well known as a depôt for patent goods, inventions, &c. We have no doubt of his efficiency to promote the interest of those parties who may favor him with their business.

Mr. TELFORD also undertakes every description of Patent Agency business for Ireland.

TO CORRESPONDENTS.

Several Communications and Works for Review, are obliged to remain till next week.

The Communication from Sunderland, *alludes to arrangements that have been previously attended to.*

"J. B.," of Glasgow, *is received. We shall consider the best means of making the correction he mentions, so as to be generally intelligible.*

GRATUITOUS COPIES *of our Journal have been forwarded to a number of Individuals interested in some Patent or Invention, of which notice has been taken in our number of today.*

"THE INVENTORS' ADVOCATE" *is published every* SATURDAY MORNING, *at* 7 o'CLOCK; and is regularly issued in MONTHLY PARTS, of which 1 *to* 18 ARE NOW READY.

"THE INVENTORS' ADVOCATE" is also published in Volumes containing the Nos. of every 6 months.

Vols. 1 and 2, handsomely bound, are already published.

TO INVENTORS.

PERSONS WHO WISH TO OBTAIN OR DISPOSE OF PATENTS, *or to bring* NEW INVENTIONS INTO USE, *are requested to apply to the* PATENT OFFICE, BRITISH and FOREIGN, No. 198, STRAND, *opposite St. Clement's Church, where they will meet with great facilities to obtain information and to carry out their views.*

THE GALLERY OF INVENTIONS,

Attached to the Patent Office, is a spacious Saloon, well lighted, in which Plans and Models are exhibited. It affords an excellent medium for bringing New Inventions into public notice.

TO CAPITALISTS, MANUFACTURERS, AND TRADERS.

Among many VALUABLE INVENTIONS *and* PATENTS *registered at the* PATENT OFFICE, BRITISH and FOREIGN, (198, STRAND), *for the investment of capital, Shares are offered for sale in the following Useful Inventions:—*

A Fire Escape of Novel Construction, which may be used as an Observatory.
A Cheap Lamp for burning Tallow and Grease, without overflow or smell.
Patent Screw Jack, for lifting locomotives and other great weights.
An Improved Balance, applicable to small or great weights.
Important Improvement in Wood Paving.
A New and Improved Method of Buraing Coke.
New Methods of Purifying and Treating Oils.
A new System of Clock-making.
Patent Forge Back.
A new Castor for Furniture.
Patent Process for the Manufacture of Soda.
Improved Methods of Building Iron Ships.
The Purification of Gas.
Improvements in Soap-making.
An Umbrella, in imitation of a Malacca Cane.

THE

INVENTORS' ADVOCATE,

AND

JOURNAL OF INDUSTRY.

SATURDAY, DECEMBER 19, 1840.

*** *The Office for the publication of* THE INVENTORS' ADVOCATE, *is removed from Tavistock Street, Covent Garden, to the Patent Office, British and Foreign,* 198, *Strand; opposite St. Clement's Church.*

The exhibition of mechanical inventions and philosophical apparatus, illustrating and explaining new scientific discoveries, is of the utmost importance to the progress of science and the improvement of the mechanical arts. In France and in Germany, annual "expositions" of works of art and manufacture had been for many years established, by the governments of those countries, before any similar exhibition existed in England. These active and direct measures to stimulate manufacturing industry in those kingdoms, ought to have at once roused the attention of our Government to the necessity of adopting some plans for encouraging the exercise of skill, and rewarding inventive genius. But, unfortunately, the progress of manufacturing arts, and of practical science, is the last consideration to which our Government directs its attention. Though not niggardly in its patronage of geographical discovery, nor in supporting literary labors of questionable or minor utility, yet those pursuits which are of vital importance to our existence as an independent and powerful nation, have been totally uncared for.

It does, indeed, seem quite unaccountable that the government of a country so essentially manufacturing as that of England, should continue to conduct its affairs as though we were now living in feudal times, and depended on the produce of the soil alone. We have frequently animadverted on this apathy and neglect of the principal sources of national wealth. It is not that one administration has been more culpable in this respect than another. They have all been equally negligent of these best interests of the country; but in proportion as the importance of encouraging mechanical skill and scientific discovery becomes more apparent, the continued neglect becomes more remarkable, and more deserving censure.

In the absence of any national institution for exhibiting the progress of manufacture and invention, the growing want of such an establishment rendered it at length a desirable object of private speculation to form an exhibition of the kind. The ADELAIDE GALLERY was the first public exhibition opened for the purpose; and its success has induced the formation of another similar institution, with more extended objects, in another part of the metropolis. Of these two exhibitions, each of which has been just re-opened for the season, we shall speak more in detail in other parts of this and our subsequent number Their general tendency and effect have been decidedly beneficial. They have served, as far as they go, to extend the knowledge of some of the more important and novel scientific discoveries; and they have been the means of showing, though in a very limited degree, some of the processes of manufactures, and the ingenious contrivances most recently invented. Similar institutions have been since formed, according to these models, in many of the principal towns in the kingdom, and we expect that, ere long, they will be generally spread over the country. The increase of such exhibitions shows clearly enough that the taste for scientific pursuits is extending; and it is satisfactory to find that the ignorance of science and of the processes of manufacture are no longer considered compatible with a liberal education.

We are glad to see these indications of a desire to obtain sound practical knowledge, and we hope that the Government, though it has failed to take the lead in the cultivation of such a taste, will not hesitate to follow the example which has been afforded by these private associations for the advancement of science; and will institute a national exhibition on a more complete and extended scale.

The two London institutions to which we have alluded, are admirably conducted, considering the circumstances under which they were formed; but it must be observed, at the same time, that it is incompatible with the means of a private undertaking, and with the view of making such exhibitions remunerative, to comprise more than a few of the most attractive processes of manufacture; or that they should be conducted on a scale sufficiently large to afford a correct notion of the working processes.

The exhibitions instituted by private companies must have reference to remunerative returns; therefore it is a principal object in the management to produce such a bill of fare, and to collect such objects, as are calculated to prove attractive to the mere sight-seeing public. They are consequently arranged less with a view to the promotion of knowledge than to the attraction of a numerous company. From the nature of their foundation this must almost necessarily be the guiding principle on which they are conducted; whilst the limited extent of the premises confines the exhibition of manufacturing processes to those only which can be carried on within a small compass, and the products of which can be sold to the company.

Were a national institution to be formed for promoting the knowledge of the manufacturing arts, and encouraging inventions and scientific discoveries, it should be conducted on a greatly enlarged and more general plan. The different branches of manufacture in the country should be exhibited in actual operation and seen in consecutive order. What is done in part, and in little, at the Polytechnic Institution and at the Adelaide Gallery, should be completed on a large scale, so that every one may have an opportunity of witnessing the methods by which the different articles of manufacture are pro-

duced and perfected. The exhibition of new inventions and apparatus should also be arranged on a systematic plan, not depending on the contributions of inventors, but on the excellence of the inventions.

In addition to the fund of knowledge of the best kind which such an institution would be the constant means of imparting, it would also prove the means of facilitating and suggesting improvements that might be of essential importance in our manufactures. Nothing is more difficult for persons living in London than to obtain an insight into the processes of manufacture. Many an essay of inventive genius is crushed from a want of knowledge of the means by which the idea may be realised. If there existed an institution in which the methods practised in different trades were readily accessible, the inventor would have no difficulty in arranging the details of his plans, and he would be able to bring to perfection valuable contrivances that are now lost from the want of such general practical knowledge.

The expense of a national establishment of the kind we have suggested need not be very great after the first foundation. If well managed, the value of the different articles manufactured might nearly meet the current expenditure. But even allowing that the national institution of manufacture were to entail a cost of twenty thousand pounds a year, or more, that would be a trifling sum compared with the importance of the object to be attained; and small also in comparison with the cost of other public exhibitions, which, however interesting, cannot compete in practical utility with the establishment which we now suggest.

NEW INVENTIONS.

At the meeting of the Society of Arts on the 9th instant, the Committee of Mechanics reported on the following inventions:—

A FIRE ALARM—BY MR. J. RAMSAY.

This invention is of a similar construction to a common watchman's rattle, to be fastened against the wall near to the door of a bed-room, &c.; a cord is fastened to a detent upon a reel, on which a chain is coiled, with a weight attached; the cord is passed down through staples in the walls of every room, in order that in whatever room the fire may break out, the burning of the cord will release the detent, and leave the weight free to act on the alarm.

A SELF-ACTING PLANING VICE—BY MR. DE JAY.

The machine is mounted on a planing board to be placed on the bench, the object being to give stability and an upright position to a board in the operation of planing its edges. Rewarded—Silver Isis medal.

LOOM FOR WEAVING WICKER.

The Committee of Manufactures reported on a Loom for Weaving Chair Bottoms, the invention of D. and H. Potts. The invention is a modification of the Jacquard loom, for the production of patterns of every variety in a fabric made of split wicker, and generally used for chair bottoms, fire-screens, and other light furniture; for which a Silver Isis medal and ten guineas were awarded.

PLAN FOR PREVENTING RAILWAY CARRIAGES FROM OVERTURNING.

Mr. Barry Jackson, a watchmaker of Durham, exhibited to Alderman Wilson, at the Mansion House, on Wednesday, the model of a design for preventing railway engines and carriages from being upset or accidentally forced off the rails. He said that his proposal was to run along the whole line of way between and at an equal distance from each rail a bar of iron or "fulciment" fixed to the ground, and reaching nearly to the bottom of the engine or carriage, from which on each side strong brackets should fall and enclose the bar, thereby effectually preventing the moving body from being overturned. As an additional security in the model a groove was made on each side of the bar, in and along which ran pins fixed to the brackets, so that should any obstruction occur on the rails to raise the wheels, the canting motion thereby occasioned was checked by the pins being forced against the upper edge of the groove; and even should one or more of the wheels break beneath the pressure thus created, the carriage itself would retain its upright position, and could not get off the line. Mr. Jackson said that, having lost his business by long illness, he had employed his mind while in the hospital at Durham in devising the plan, which he had been told by some scientific person, who recommended him to come to the metropolis with the model, was calculated to answer the purpose of public security most completely. Alderman Wilson, having examined the model, said that a glance would prove that the means of security were quite satisfactory, but he apprehended that the expense would be a complete obstacle to its adoption. It struck him that Mr. Kollman's railroad invention was identical in principle with that of Mr. Jackson, and had the extraordinary power of mounting hills and turning corners with amazing facility. The expense of that improvement, however, he supposed interfered with its success, although the first men in the country had witnessed and applauded it. Mr. Jackson said that when he hit upon the expedient he determined as soon as he should have strength sufficient to travel to come to London and submit it to the Lord Mayor. He had travelled 300 miles for that purpose, and he was convinced that some experiment of the kind must be adopted, or the lives of multitudes would be in constant jeopardy.

Alderman Wilson advised Mr. Jackson to take his invention to the Society of Arts.

THE MATHEMATICAL POWER LOOM.

By the introduction of this invention it is expected a powerful stimulus will be given to a staple manufacture in this country;—viz., the linen trade, which has for many years been in a drooping state, chiefly owing to the low price of labor in Scotland. The mathematical loom is equally applicable to the manufacture of worsted, cotton, and all other fibrous substances. This machine is called a mathematical loom, because the quantity of weft or woof is determined by calculation or measurement, thus securing at pleasure cloth of any fabric or stoutness, and perfectly equal throughout. The pressure upon the warp-thread can be varied to suit the strength of the warp; so that the strongest or most delicate yarns can be woven, and a firm or soft fabric produced without any difficulty. This loom performs the whole work of weaving, and will produce a piece of cloth of the ordinary length without the alteration of any of its parts. It has woven two bolts, or 30 yards, of the heaviest sailcloth in 12½ hours; and the inventor has stated that he would undertake to do that quantity in less time.—*Durham Chronicle.*

DYNAMOMETER FOR MEASURING THE FRICTION ON ROADS, RAILWAYS, CANALS, ETC.

Mr. H. Carr has effected a modification of this instrument to obviate the irregularity of the common indicator arm, caused by the jerking motion of the tractive power, or any inequality of resistance. The instrument consists of a cylinder half filled with mercury, and containing a piston connected with the spring of the dynamometer, so as to be lowered or raised as the tractive power is increased or diminished. Two tubes of glass, connected by a passage with a regulating valve, stand in front of the cylinder; one of them communicating freely with it, and in this tube the mercury is raised or lowered proportionally to the power applied; while in the other, an average of the variations is obtained as the facility of communication between the tubes is increased or diminished by the opening or closing of the stop valve. The instrument must be graduated by actual experiment, and the results of the average power may be read off from the scales, placed behind the tubes.

MODE OF COVERING ROOFS WITH PLANKING.

The following mode of roofing buildings with planks instead of slates, has been communicated to the Institution of Civil Engineers, by Mr. W. Cubitt. The roof itself is framed in the usual manner with principals and purlins, but without rafters. The boards intended for the covering are cut, by means of a circular saw, from planks 7 inches wide by 2½ inches thick, in such manner that each plank makes two boards, the one tapering from its centre towards the edges, the other from its edges towards the centre. The hollow boards are laid side by side, at intervals of 4½ inches, and nailed to the purlins by their centres only, so as to admit of shrinking; the intervening spaces are then covered by the other boards, overlapping 1¼ inch on each edge, and nailed in like manner. The covering thus formed presents a series of alternate elevations and depressions, longitudinally from the ridge to the gutter, and consequently the rain falls off very rapidly, and a roof so constructed is easily kept water-tight. Mr. Cubitt conceives this to be the most economical mode of using timber for covering, and he has adopted it extensively. The communication was accompanied by a model of the roof and specimens of the boards as they are left by the saw.

MILL FOR MAKING OLIVE OIL.

M. Stancovich, who has been for some time engaged in a work on the history of olive trees, has sent a paper to the agricultural section of the Academy of Sciences, on the modern and ancient methods of making oil in different countries, with an account of the new oil-mill invented by him. It was previously known that the stones of olives do not contain oil;—that the small quantity found in their kernel was of an inferior quality,—and that it injured the quality of that derived from the pulp of the fruit. It had been stated by the late Olivier, member of the Institute, that "it would be a great advantage if the fruit could easily be separated from the stones of olives, so that the oil could be made separately, as it would be purer and would keep better." This is what M. Stancovich has done by means of the mill he has invented, and to which he has given his name. In order to make it more generally understood, he has exhibited a model of it, which was put in operation and gave general satisfaction, although the olives that he used were gathered before they were ripe. When dried and afterwards softened they were torn from the stones by a few turns of the handle of the machine. The portable *Spolpolion*, when reduced to a third of the original size, may be large enough for a manufacturer whose business is not very extensive; and one horse is able to turn four large ones, as well as the mills for breaking the stones. A greater quantity of better oil could be made more quickly and more economically in this manner than by bruising the olives under the heavy mill-stones at present employed.

NEW CALCULATING MACHINE.

M. Leo Lalanne, engineer of roads and bridges, in a late sitting of the Academy of Sciences, has shown the utility of graphic or mechanical processes in the solution of equations which would otherwise require very long calculation. Various attempts have been made to accomplish this. One of the best machines previously proposed for this purpose is that of M. Bernard. His

machine is a weighing one, and adapted for ascertaining the roots of numerical equations. M. Lalanne, who had previously applied the principle of the lever in the solution of all arithmetical operations, by making a very simple alteration in the calculating scale of Bernard, has succeeded in rendering an idea practicable which had lain dormant for more than thirty years. The inventor, in exhibiting this new instrument, stated in what the modification consisted that he has applied to the calculating machine, and pointed out the general rules to be attended to in preparing the equations to be solved.—*Moniteur Industriel.*

INDIGO MADE FROM SAWDUST.

The *Industriel Alsacien* states that the attention of the manufacturing community of Mulhausen has been lately occupied by the announcement of a discovery, which, if it can be practically realised, promises to be of immense importance: it is nothing less than the manufacture of indigo from oak sawdust, by means of certain chemical preparations. The experiments have been made in a village in the environs of Altkirch, and the first results are stated to be very conclusive. It is affirmed that a piece of this indiginous indigo, extracted from the sweepings of the timber-yard, has been analysed, and that it presented all the constituents of the real indigo.

NEW PLAN OF BRIDGE-BUILDING.

At the annual meeting of the Bath and West of England Society, for the Encouragement of Agriculture, Arts, Manufactures, and Commerce, which was held last week at Bath, Mr. Dredge of that city exhibited a model of his plan of bridge building, which he explained at great length.

Mr. Dredge observed, that a bridge ought to last as long as the material of which it was built; but this was not the case, for nothing was more common than to hear of the destruction of new as well as of old bridges. If any implement, such as the common spade or shovel, or any other ordinary instrument, did not endure a reasonable wear and tear, the cause of it would easily be found out; and the great defect that exists in the construction of bridges would be discovered with the same facility did we not allow custom and other circumstances to warp the judgment. The view that he took of bridges is, that they are only brackets, and should be dependent on their bases or abutments, and the strength of the material of which they were constructed; like the human arm, which depends on the shoulder, and not on the fingers' ends; or as the limb of the oak, which is sustained by the larger part of the branch that grows from the tree, and not by the ends of the twigs at its farthest projections. But bridges had hitherto been made to rest on their centres; hence the superfluous material in them, and the immense leverage that existed on their centres, were the causes of their destruction. For instance, in a common bridge, the depth of which was one twentieth of its length, and the weight 1,000 tons, the central force was 5,000 tons; instead of which no description of force or weight should exist on the centre of the arch of a bridge, for it was but the extremity of two projections. Thus then in that bridge, from its mode of construction, 666 tons of material, and 4,500 tons of power, were lost, or, in other words, the same material would construct three bridges of the same dimensions, and each of them would be 4,500 tons stronger. The system of bridge-building which he was then, and had been for some years, advocating, was partially carried out in the construction of a compression bridge at the castle of Wandipore, in Thibet, in 1640, which, after having stood 143 years, was examined by Captain Turner, who stated in his narrative of a journey through a part of Thibet, that the bridge was constructed of timber, and that it had never been painted, or protected by any means from the weather, and that then (in 1783) it was perfectly sound. The reason why he alluded to this bridge was merely to show that had it been of the same dimensions at the centre as at the abutments, like common bridges, three times the material must have been used in its construction, and then, instead of its lasting 143 years without exhibiting any marks of decay, it would not have lasted as many days; in fact, it must have been crushed under its own weight. In 1836 this system was carried out in the Victoria Bridge, in Bath; and since then Lord Western, in a letter to Lord Melbourne, had most clearly explained the unerring truth of the principles on which it was founded. Mr. Dredge then proceeded to explain more minutely the different parts of the model which he produced, pointing out the difference which existed in the bridges as at present constructed, and those erected upon the principles he laid down.

Dr. Wilkinson spoke in high terms of Mr. Dredge's plan. The subject, he said, had excited much of his (Dr. W.'s) attention, and though several years ago he felt a prejudice against Mr. D.'s plan, since he had read the letter of Lord Western on his bridge, and more closely examined its principles, he had found his conclusions to have been at first formed rather hastily. He was now convinced Mr. Dredge had arrived at the nearest point of perfection in the construction of suspension bridges. Dr. W. went into a scientific account of the mechanical laws and arrangements by which Mr. D. had been guided in his mode of erecting them; and an analogical illustration from the structure and physiological use of the human spine, to show how provisions had been made in each case for adapting the mechanical strength to the position and point of pressure which mostly demand it. He concluded by noticing a vibratory effect which was produced by the transit of carriages, under certain circumstances, over these bridges, which he suggested as worthy the consideration of Mr. D., for devising still further improvements in them.

A few questions were put to Mr. Dredge by gentlemen present, which were answered satisfactorily, after which the chairman expressed the great gratification the meeting had experienced, and the obligations they were under to Mr. Dredge for his valuable communication.

THE ORIGINAL INVENTOR OF FELTED CLOTH.

The *Courrier Belge* gives the following account of the origin of the invention of Felted Cloth, and the history of the inventor, whose case, if stated correctly, seems a very hard one:—

"It is known what a revolution is taking place by the manufacture of felted cloth, an invention which we predicted so long ago as the year 1828. It appeared so rational an idea, that an order was given to M. Jacquot for a pair of shoes, made of this material. This ingenious manufacturer at the same time made many pairs of boots, but he did nothing more. About the same time a very clever officer, Sebastien Botturi de Briscia, conceived a similar idea, at the distance of 400 leagues from Brussels. His perseverance was greater than ours, for in November 1830 he presented to the Imperial Institute of Science at Milan, shoes, boots, gloves, and clothes, made of felted cloth, without being either cut or seamed. The Imperial Institute made an official statement that this manufacture had been examined with much interest.

"Further; Botturi, at the exhibition at Venice, on the 30th of September, received a silver medal for clothes made of felted cloth without being cut. On the 28th February, 1837, he received a letter of thanks from the Queen of England, for a pair of felted boots that he had manufactured for her. He has also in his possession a certificate, dated the 22d of February, 1838, in which the society for protection of life from fire authorise William Spring to declare that a very favorable opinion was entertained of the clothes which had been manufactured by him, of incombustible felted cloth. He had previously shown, on the 27th of June, 1832, to the Minister of War, in France, clothes and cuirasses which a ball could not penetrate. He received a letter from the Minister, proposing to him to commence a manufactory, offering machinery and money for the purpose. Since that time, he relinquished the manufacture of those particular articles, for the manufacture of cloth without spinning or weaving. He succeeded perfectly; but being a stranger to the language and to the tricks of the tradesmen who surrounded him, and who harassed and perplexed him in a thousand different ways,—he concluded by allowing his secret to be stolen from him, which was sold in England by some pretended Americans; and a manufactory was established at Leeds, where it was quickly carried on. But they were unacquainted with a later improvement, for rendering the cloth more even. Botturi was induced to go to Brussels where he succeeded in founding an establishment with some capitalists of Paris and London. These pretended capitalists have just allowed this dawning establishment to be placed under the public seal for the sake of some thousand francs that were wanting.

"The most important circumstance for the inventor is, that the machine which belonged to him is included in the same engagement. Behold the poor inventor again thrown on the world—his machinery taken from him, and possessing no interest, nor any appeal against the artful speculators who, by means of his invention, have acquired wealth in every country."

POLYTECHNIC INSTITUTION.

This valuable institution, for the promotion of science and the mechanical arts, re-opened to the public on Saturday, after having been for some time closed, to effect an enlargement of the space appropriated to public exhibition, and to increase and re-arrange the objects exhibited. The additions to the rooms are at the western extremity of the great hall. They consist of an additional lecture-room, fitted up with apparatus for chemical and electrical experiments, and of six or seven smaller apartments; comprising, among the rest, a cosmoramic exhibition. The hall of manufactures, into which the visitor first enters, remains in much the same state as before. The principal alteration is the substitution of an alternating steam at work, for the rotary steam engine that was seldom in action. We regret that some further change has not taken place here; it is a fine space almost wasted, and serves merely as a vestibule through which the company pass. On entering the great hall, an entirely new scene presents itself. What was before dead, has now an animating appearance. The steam-engine is made to work a variety of machines, the movements of which excite interest, and serve to keep the attention from flagging. Among the most prominent of these machines thus put in action, is a model of Hall's hydraulic belt, which lifts a large body of water from the lowest level of the canal, to nearly the top of the room, whence it is thrown off. Two large magical discs, which make stationary figures painted on them appear to move, are kept revolving, and serve as a constant source of amusement to the sight-seeing visitors, and of interesting consideration to the philosopher. There are also several models of steam-engines of all sizes and kinds kept in action by the same moving power that turns the other machines. The diving bell, the diver, and the explosion of gunpowder under water, are retained among the exhibitions in the great hall; and they seem to have lost none of their attractions. The royal bell, as it may now be called, since it has been honored by Prince Albert's presence within its water-excluding air-compressing confines, is in greater request than is perhaps desirable to those who are waiting to see the microscope. The microscope itself seems much improved. The light is brighter, and the delineation of the objects in the centre of the disc remarkably clear and distinct. We would suggest, however, a better

choice of the objects exhibited, for the purpose of showing the extraordinary powers of the instrument. Slices of wood and of madrepores are curious of themselves, but they are not nearly so interesting as known objects; whilst the latter afford the only test to the spectator of the magnifying power. The models of different kinds, and the objects of art, are extremely numerous: they are better arranged and more easily seen than before; but there is a want of explanatory labels, to enable the visitors to see at once what they are. There is, indeed, altogether a vast improvement in the exhibition. There is more *life*, too, in the manner of exhibiting, but still there is room for further amendment in the latter particular. The panses between the principal exhibitions, which were formerly so long, have been diminished, and there are, besides, more things to be looked at than there were; yet, even now, the rests are too long. Many curious machines that visitors might wish to see in action, are not to be seen viewed at stated intervals, and those intervals are far between. There were two or three we were anxious to see in operation, but, though present for two hours, their time had not come. Attention to these little matters would greatly enhance the value of the institution and make the exhibition go off with more spirit. We must not omit among the additions a band of music, which, from time to time, played enlivening airs, and materially increased the animation of the scene. We were glad to find the rooms very well attended. The interest in exhibitions of this kind, which combine so much instruction with amusement, is evidently on the increase.

THE GANNAL PROCESS,

THE MEANS BY WHICH THE DECOMPOSITION OF ANIMAL SUBSTANCES IS PREVENTED.

It will be remembered that about two years since M. Gannal, a French chemist, visited this country with a view to introduce to the attention of the public, both scientific and general, a process by which he could arrest the decay of animal matter, and which is used to some extent in Paris with the dead, prior to their being interred in Père la Chaise and other cemeteries. From the numerous extracts we have lately given in our columns, from Mr. G. A. Walker's (the surgeon) work on the "Graveyards of the Metropolis," it must be acknowledged by all, that the system at present pursued in the burial of the deceased beneath the churches, and in the grounds adjacent, in the very centre of the metropolis, is any thing but salubrious: on the contrary, it has been pronounced by excellent authorities decidedly prejudical—to say nothing of the *systems* which Mr. Walker's work so meritoriously exposes,—the *management* as it is termed by "*grave diggers*," more correctly shown to be by Mr. Walker "*grave emptiers*."

On M. Gannal's visiting London in November 1838, he applied to Dr. Somerville, (the inspector appointed by Government to regulate the distribution of bodies for anatomical purposes to the medical schools of the metropolis,) for a subject to operate upon. A subject was granted for the purpose of experiment, and was delivered into the charge of Mr. Gregory Smith, the lecturer on anatomy at the School of Medicine, Little Windmill-street, Haymarket, and in whose charge the body has been ever since.

M. Gannal injected the carotid artery of one side, on the 9th November, 1838 (four days after death), with the prepared fluid (*acetate of alumina*) in the direction of the heart, in the presence of Mr. Gregory Smith, and others. Almost immediately after the injection the body became firm and rigid, like wax. The body was a day or two afterwards besmeared with a little wax, the eyes removed and glass ones introduced, and the face, which has since been exposed to the light, covered with a coating of wax; the body was then wrapped in about 200 yards of bandages, which were previously soaked in some *aromatic* fluids, but not in the *acetate of alumina*. Beneath the bandages on the surface of the body thin sheet lead was placed, which was stated to be rather hurtful than otherwise. The body having been injected and rolled with the aromatic bandages, and the face covered with wax, it was placed in the coffin, and until Tuesday, Dec. 15, 1840, had not been removed.

The patentee in this country, Mr. George Smith, feeling assured of the efficacy of the prepared fluid in arresting or preventing animal matter from decomposing, invited the scientific and public generally to witness the unrolling and examination of the body of Berry, aged 33, who died in Bridewell on the 5th of Nov., 1838, and was injected and prepared on the 9th of that month, in the same year. This took place at the Theatre of Anatomy, in Little Windmill-street, Haymarket, on Tuesday, Dec. 15., at 2 o'clock, in the presence of Mr. Wakley, and numerous professional men, both scientific and literary. Mr. Gregory Smith, the lecturer on anatomy, (in no way connected with the patentee), in whose charge the body had been placed, and who was alone responsible that nothing had been done to it since it was placed in the coffin by M. Gannal, stated the particulars as above given, and unrolled in the presence of the audience, and examined anatomically the various organs of the body.

The general surface was soft and pliant, of the color of a Malay, but not quite so dark. The face retained its form well. The nose preserved a natural roundness, although the countenance was in some degree contracted. Mr. Gregory Smith very obligingly gave every information with the utmost candor; he did not speak in any manner in favor of the process, those present he allowed to form their own opinions. At the request of several surgeons, the abdomen, chest, and head were examined; the viscera were in a very satisfactory state, with the exception of the brain, which did not retain its form or firmness (owing to its nature) so well as the intestines, heart, &c. Many of the muscles of the thigh and other parts still retained their red color; no signs of actual decomposition were evident, neither was the peculiar odor that of decomposition, but the faint effluvia arising from the aromated bandages, &c. The knife with which the examination was performed did not appear to be affected by the fluid, which had been injected.

In offering an opinion on the above process, we can but observe that to our minds the prepared fluid (acetate of alumina) evidently possessed the the perty of arresting decomposition; and under procircumstances, this process being ready to be applied on the instant, and at a moderate expense, which arrests putrescency and liability to contagion, and which occupies but a short time in performing, and is unattended with any distressing disfigurement of the person; these are sufficient grounds at least for sanctioning its introduction, as long as the revolting custom of inhuming the dead in the midst of the living, so rigorously and strenuously prevails in the most wealthy and enlightened city in the world,—"The Great Metropolis."

PREVENTION OF RAILWAY ACCIDENTS.

To the Editor of the "Inventors' Advocate."

Sir,—Since my last letter, inserted in No. 41 of your excellent journal, (upon Encouragement to Engineers, &c.), events of great importance have taken place upon the different lines of railways. I consider it is the duty of every man, particularly those employed on railways, to exert themselves in every way possible, for the prevention of accidents, by devising and suggesting to directors any means of improving the present system.

I have strictly observed every occurrence that has taken place for some time; also, your's and other journalists' observations respecting them, with their propositions and plans for the improving and working of railways; but, with the exception of your own, (viz., the appointment of a captain over each train), no practical plan has been brought forward. For your suggestion, I consider you deserve praise and honor, for you have given another proof of your advocacy of those principles which must sooner or later prevail. Such appointments, and the rules to act upon, are founded upon a good basis; the plan will be attended with beneficial results. I could point out many men who are both qualified for, and willing to, undertake the responsibility of engineers, or any other employment upon railways, if the salary was equal to the risk and responsibility incurred; and, what is of still more importance, if *merit and good conduct* would guarantee a permanency of their situations.

Only let merit, accompanied with regularity and sobriety, be the standard whereby engineers shall in future receive pay, rewards, and promotion,—let men of this description only be convinced that this system will be acted upon, and it will induce respectable men to engage, and stimulate them to exertions and to vie with each other in serving their employers, faithfully and honestly.

I cannot pass over the conclusions come to, and opinions generally expressed, by most public writers respecting engine-drivers, and others employed upon railways, without offering a few observations.

It seems that this class of persons are rated without *exception* very low in the scale, both of mechanical and educational knowledge, and consequently unworthy to hold their situations. To a certain extent I admit it. But on the other hand, I can prove that exceptions ought to be made to this rule, first, because many men employed upon the works are both respectable and competent persons, and qualified to fill higher situations. And further that the system itself is one great cause of mishaps. It is admitted by all parties, that engineers of locomotives should understand the construction of working and repairing their engines; that they should be men of sobriety, regularity, and honesty; that they should be men of education, who would feel the moral responsibility of their situations. How, I would ask, are these qualifications to be proved, when generally, those who have the selection of the men and direction of the works, are not themselves possessed of this very necessary knowledge; but are obliged to receive that information from others? This proves that the system is one cause of failure. And therefore if either managers, superintendants, or engineers are not possessed of this knowledge, they are unworthy to hold their several situations. Hence arises the necessity of some board to examine engineers, and to make rules to guide them.

The next point for consideration is, why so great a distance appears to separate the managers of railways from those employed upon them, and why the latter are considered so inferior? One reason is, that no difference is made between engineers and engine-drivers; that no difference is made between those who are capable of taking the lead and those who are obliged to follow in the repairing, &c.; that no distinction is made between those men who conduct themselves properly and respectfully and the men who care neither for one or the other. Now, I consider the degree of respectability attached to the situation of engine-driver or engineer about equal to a mule driver or muleteer; therefore, if all persons employed in locomotive workshops are ranged under the same scale as engine-drivers, what man possessing the necessary qualification for so responsible a situation would accept of it, when, by so doing, he would lower instead of raise himself in the scale of society. Therefore, until encouragement is offered to respectable and qualified persons to engage, the space between the parties must remain void.

The most important part, and that requiring the greatest consideration, is the rules for the new system, and what would be the duties of captains of trains. Upon this depends the success or failure of the plan. I consider that each captain should be invested with full power and authority over the train. That he should keep a log of all that takes place upon the journey. That he should see the engine examined at each station and

report the state found in. That all orders or notices of change or of danger be delivered to him. The order for starting or stopping the train, to emanate from him. That he report the different rates of speed at certain points of the road; and when time is lost by the engine to report the cause, if either from slipping, loss of steam, from bad joints, &c, &c. I had written out rules in detail, both for the out door working of the engines, and also for the repairing of them; but I fear that I have already exceeded your limits. Should you think them worthy of a place in your journal, I will forward them at a future time. Your insertion of this letter will oblige a constant subscriber,

A. W. B.

ORIGINAL REPORTS OF SCIENTIFIC MEETINGS.

(Contributed expressly to the Inventors' Advocate.)

MEETINGS OF THE SCIENTIFIC BODIES OF LONDON,—FOR THE WEEK COMMENCING DECEMBER 21, 1840.

Monday.	Statistical Society 8	P.M.
	British Architects 8	P.M.
Tuesday.	Zoological Society 8½	P.M.
Wednesday.	Society of Arts..... 7½	P.M.
	Microscopical Society 8	P.M.
Thursday.	Royal Antiquaries Society 8	P.M.
Saturday.	Mathematical Society 8	P.M.

SOCIETY OF ARTS.

Dec. 8. Illustration Meeting.

Mr. C. J. Deville delivered a lecture "On the Configuration of the Crania of different Nations." The subject of national crania has engaged the attention of the lecturer for upwards of 20 years. The lecturer commenced by showing, that knowledge and power of mind depends upon a moderate and full development of the anterior part of the head (forehead), and he wished to impress upon the minds of the audience, that it does not follow that the man with the largest head should possess a power of intellect greater than he who possesses but a moderate sized one; nature having her bounds and proper limits in this as in all other things. That the external form of the head is dependent on the size and configuration of the brain, is a point he considered fully settled and beyond all dispute. He subdivided the brain into three principal divisions, dependent on the character and habits of mankind generally. The first division included those propensities common to man and animals; the second, the moral sentiments common to mankind in general; and the third, the intellectual faculties.

In support of Mr. D.'s opinion, that the external form of the head was dependent on the development of the brain within the skull, and that the propensities or faculties of mankind in general might be adduced by an examination of the facial angle, he had selected a series of diagrams in outline, showing the contour of the heads of two individuals of very opposite characters and dispositions, and in which a marked and very decided difference was observable; as, for example, the head of the Northamptonshire poet, when contrasted with the head of an idiot;—the head of the poet Burns and that of a pirate;—that of a daring and enterprising Spanish pirate (a gentleman of property who built a ship to plunder) as contraated with an ancient Peruvian;—the outline of the head of an Egyptian priest, and that of Bellingham, the individual who shot Mr. Perceval (the animal propensity in the latter being very large);—a negro of superior race, who saved the revolt at St. Domingo, and that of a common negro (the brain of the former was more fully developed). In all these, and many other instances adduced, the opinion entertained by the lecturer was fully borne out.

He then traced and pointed out the peculiarities in the different regions of the head, in natives existing in the extremes of heat and cold, and showed how it was that the Esquimaux could live in regions which freeze quicksilver,—and the opposite in those of the torrid zone, who endure and are content with the heat of the burning sun. Mr. Deville could not support the theory that the human race throughout the world are of one variety only; nor does he consider that the differences observable in the different races of mankind are the effects of vicissitude of climate and other causes, although each race will be found adapted to its physical condition. He then entered upon the divisions of the human race as proposed by Linnæus, Blumenbach, Buffon, Cuvier, Gory, and others, and pointed out the very different and opposite opinions and classifications adopted by these authors, fully confirmative in his mind as the cause why so many phrenologists reject all system in their pursuits. In establishing their systems, Cuvier, Linnæus, and Blumenbach, not only considered the form of the head, the facial angle, and the cubical measurement of the interior of the skull, but also the weight of the brain, and even the nature of the bones. Phrenologists, at the present day, take all their characters from the configuration of the brain, and external appearance of the skull. The science treats only of the doctrines of the manifestations of the mind, and not the mind itself.

Mr. Deville, in the next place, made a rapid survey of the skulls of the different races of mankind, pointing out as he proceeded the gradual full development which takes place in the anterior part of the head from the most uncivilised up to the most enlightened of nature's beings. He is of opinion aso, that by education the form of the head becomes longer, an instance of which he gave in the circumstance, that since the emancipation of the negroes the hats are obliged to be made of a more elongated form; and also that many years ago he was informed by Lord Eldon's and Justice Bailey's peruke-maker, that he was obliged to make their wigs longer on more than one occasion. Among many interesting crania exhibited were six obtained from ancients tombs in Peru, at an elevation of about 14,000 feet; discovered and brought to this country by Mr. Pentland, some years since, when deputed to inspect the gold and silver mines in South America. Baron Cuvier and Mr. Deville inspected and reported on them, and, in their opinion, they consider them to have been a race of beings (ancient Peruvians), of which no existing type remains on the earth, at least as at present known. The tombs in which the bones were found were well constructed, and contained the heads of old and young individuals, supposed to have been destroyed at least 1,000 years ago. The peculiarities of the contour of the skulls were—a small intellectual region, a large animal region, and small coronal—characters sufficient in the opinion of Mr. D. to pronounce of their total incapability of providing for themselves, and if it pleased God to produce famine and drought in the particular region they inhabited, they must all have perished; and judging from the crania, they must have been much lower in the scale of creation, as to intellect and means of obtaining their own sustenance, than the higher class of animals; and, he also concludes, must have been a dangerous and immoral race.

METEOROLOGICAL SOCIETY.

Dec. 8. Dr. M'Intyre, Vice-President, in the Chair.

Samuel Kingsford. Esq., Canterbury, was elected a member. Donations to the library were announced from Professor Silliman, New York, and from the East India Company.—Meteorological tables were then compared from Gosport, Wycombe, Thetford, Hereford, Sheffield, Carlisle, Yarm, Nottingham, Thwaite, Exeter, Canterbury, Ipswich, and London; and a very remarkable coincidence of barometric curves was observed during the great and rapid fluctuations of the barometer during the month. The secretary then read many interesting notices from the above tables relating to gales, rain, *auroræ boreales*, and diseases for which the month of November is generally very remarkable.

An eminent surgeon at Thetford, in his table, remarks, "In November the diseases have been comparatively few in this neighborhood, considering the season of the year, and which I have observed to be the case when the atmospherical pressure has been extraordinarily fluctuating. The human system cannot bear a long continued state of either fine or wet weather, which in time produces diseases; and it is so ordered by Providence, that variety in this respect should be experienced. I perfectly recollect in 1818, from the long drought, there were many cases of fever and inflammatory affections of the feet; and the long continued wet three or four years since gave us epidemics and influenza, which proved destructive to human life. Although, in the last month we had much wet, yet it was much accompanied by strong winds. By referring to the weather in January 1837, when the influenza was present, there was a mild temperature, moderate winds, and much wet, and this may account in some degree tor the less disease now present, from the stormy winds—very few cases of fever have been under observation, but the most prevalent complaint, especially during the last ten days, has been diarrhœa, arising probably from the sudden transitions of severe cold to mild temperature. Elderly persons have chiefly suffered. I find it thus prevalent by examining the medical reports of this union, embracing nearly seventeen thousand inhabitants."

An interesting discussion followed on the movement of the barometric column. The meeting then adjourned to January 12.

SCIENTIFIC SOCIETY.

We have omitted to notice the assembling of the above valuable Society, which held its first meeting for the season on Thursday evening, Nov. 19, at their rooms in Great Russell-street, Bloomsbury. In the absence of the President, one of the Vice-Presidents, John Stevens, Esq., delivered the annual address, in which, after adverting to the advanced position of the institution, he explained, at some length, its characteristic features, and the peculiar objects which it is designed to promote. The great and known want of adequate facilities for collecting and registering the scientific observations, seriously impeded the progress of inductive generalisation,—facts are lost for want of channels through which they may be brought to a common centre, and there has never yet been formed a Museum of recorded and classified data, to which the scientific inquirer may resort for evidence to support or subvert theoretical views. The leading purpose of the Scientific Society is to supply this deficiency, but they can only hope to succeed in so arduous an undertaking, by the most active individual exertion, and by the friendly co-operation of those who are interested in the advancement of science. After the address a paper was read on a new discovery in Electrotype. The meeting was numerously attended, both by members and visitors, which evinces the interest taken in the proceedings of the society.

SCIENTIFIC MEMORANDA, AND NOTES ON ART.

Effect of Winds upon the Atmosphere.—The following laws have been deduced from extended experiments by Kamtz and Dove. 1. The barometer falls under the influence of the east, south-east and south winds; the descent changes to ascent by the south-west wind; rises by the west, north-west and north winds; the ascent changes to descent by the north-east wind. This law is deduced from observations, made at Paris four times a day, at first for five years, then for ten years, 1816-25. 2. The thermometer rises by the east, south-east and south winds; the ascent changes to descent by the south-west wind; falls by the west, north-west and north; the descent changes to ascent by the north-east wind. This and the following are believed to be based upon observations made at Paris and London, and have been confirmed by observations of Kamtz himself during four years. 3. The elasticity of aqueous vapor is increased by the east, south-east and south winds; its increase changes to decrease by the south-west wind; it decreases by the west, north-east and north winds, and its decrease changes to increase by the north-east wind. 4. The humidity of the atmosphere decreases relatively from the west wind, passing by the north to the east, and increases, on the contrary, from the east by the south to the west.

Atmospherical Phenomenon.—On the 25th of November, at 9½ a.m., the singular phenomenon of a solar arch of frostbow was observed at Rutland, in that part of the sky

where a rainbow would naturally appear, but no rain was falling at the time; and the arch was much broader and fainter than the rainbow, of a whitish hue, and more distinct towards the horizon than the vertex; the morning was foggy, and the temperature 31 deg. Such phenomena are not frequent, and when they have been observed have usually preceded very frosty weather. One was noticed a few days before the commencement of the great frost of 1739-40, which frost was exceedingly severe, lasting 54 days, killing many birds, and destroying or damaging many trees.—*Stamford Mercury.*

Spots on the Sun.—An astronomer of Rennes made, upon the 6th inst., the following observations upon the sun's disc:—"On the 6th of December, at 9 o'clock 59 minutes 26 seconds in the morning, I observed on the sun's disc ten spots, seven of which were covered with nebulous appearances. Of the three placed towards the south the largest contained twice the diameter of the earth. Of the three which were placed at the east, one had the form of a pyramid turned upside down. Of the four placed at the west, one had the same form; the fourth resembled the bow of a circle. I had never seen before a similar phenomenon."

Eclipses of 1841.—In 1841 there will be four eclipses of the sun and two of the moon.—1. A partial eclipse of the sun, invisible at Greenwich. Begins on the earth generally, Jan. 22, at 55m. past four, P.M.; and ends 53m. past five. This eclipse will only be visible in a small portion of the Southern Ocean.—2. A total eclipse of the moon, visible at Greenwich. First penumbral contact, Feb. 5, 11h. 24m., P.M. First contact with dark shadow, Feb. 6, 12h. 24m. A.M. Middle of the eclipse, 2h. 5m.; end 3h. 53m. Final penumbral contact, 4h. 49m.—3. A partial eclipse of the sun, invisible at Greenwich. Begins on the earth generally, Feb. 21, at 54m. past nine, A.M.; and ends at 14m. past twelve. Greatest eclipse at 4m. past eleven. Visible in the North Atlantic Ocean, Iceland, and East Greenland.—4. A partial eclipse of the sun, invisible at Greenwich. Begins on the earth generally, July 18, at 46m. past twelve, P.M.; and ends 3m. past four. Greatest eclipse at 25m. past two. This eclipse will be visible in the Northern Ocean, Norway, Sweden, Russia, Prussia, Italy, North of France, Germany, and Scotland.—5. A total eclipse of the moon, invisible at Greenwich, Aug. 2. First penumbral contact, 6h. 54m., A.M. First contact with dark shadow, 8h. 3m. Middle of the eclipse 10h.; end 11h. 58m. Final penumbral contact, 1h. 8m., P.M.—6. A partial eclipse of the sun, invisible at Greenwich. Begins on the earth generally, August 16, at eight o'clock, P.M.; and ends at 40m. past ten. Greatest eclipse at 20m. past nine. This eclipse will be visible in the South Pacific Ocean, and part of the Southern Ocean.

The Temperature.—The following indicates the state of the temperature from December 8 to 16. It is taken from a self-registering thermometer, placed about five feet from the ground in the New Kent Road:—

		Lowest point at night	Highest point in the shade during the day.	Highest point in the sun.
Tuesday, Dec.	8th..	32	42	42
	9th	30	40	56
	10th	31	42	44
	11th	33	37	37
	12th	34	38	38
	13th	32	34	34
	14th	25	31	45
	15th	24	29	42
	16th	22		

Apparatus for preventing the Explosion of Steam Boilers.—The frequent explosions of steam boilers, caused in many instances by the steam being confined until it acquires a density greater than the boiler can resist, induced Mr. R. Ewen to invent a simple, self-acting apparatus, intended to warn the engineer whenever the pressure exceeded the proper degree of safety. The apparatus under consideration is constructed on the principle that steam, in proportion to its density, will support a column of water, or mercury, of a given height, and that any fluid will find the same level in two or more vessels, provided there be a free communication between them. It may be called a mercurial safety valve, and consists of a cylinder, within which are two cups, with two pipes dipping into them of a length proportioned to the pressure of the steam; these pipes are connected at the top with two valves on one spindle, so arranged as that when one is open the other must be closed. On the top is a waste steam-pipe open to the atmosphere. One pipe being filled with mercury, and the valve connected with it being open, the mercury remains stationary until the pressure of the steam exceeds its proper point. It will then be blown out and fall into the empty cup, allowing the steam to escape by the waste pipe, and giving warning to the engineer by its noise. When the pressure is again reduced to its proper point the valve is reversed, and the mercury will on the next occasion of an increase of pressure, be blown back again, still giving warning on either side.

Proposed Suspension Bridge over the Hastar Lake at Portsmouth.—The usual calculation for the maximum load on each superficial foot of the platforms of suspension bridges is 70 lbs.; but, as in the event of a crowd of persons assembling, the pressure may increase to nearly 100 lbs. per foot, and by the passage of soldiers marching in regular time the strain may be greatly augmented, the projector assumed 200 lbs. per superficial foot as the amount of load to which the platform might be subjected. The peculiar feature of this bridge is the substitution of cast iron chains for the wrought iron ones generally used. This deviation from the usual practice is adopted as a measure of economy, and with a view of increasing their stability and durability, cast iron being much less influenced by atmospheric action than wrought iron. Cast iron beams, when well proportioned, will bear a very considerable tensile strain. As these chains would be proved beyond the weight they are intended to bear, no doubt is entertained by the author of their security. The platform, which is formed of transverse iron girders carrying cast iron plates three-quarters of an inch thick, with dovetails falling into holes cast in the girders, is suspended by wrought iron rods 1½ inch square from two lines of chain only, as the strain is more easily brought to bear on them than on a greater number of chains. They are trussed laterally to prevent oscillation, and the balustrade is so constructed as to prevent the undulation so prejudicial to suspension bridges generally. To insure a perfect bearing, each pair of links of the chains are in manufacturing cramped together, and the holes bored out to receive the pins, which are turned to fit them accurately; they are of a larger size than usual, being four inches diameter, and a less number are employed. The piers on which the chains pass are of cast iron, 33 feet high above the level of the roadway.

The extreme length of the bridge is	632	feet.
The breadth of the roadway	17½	—
The clear waterway between the piers	300	—
The clear headway of the platform above the high water line.....	18½	—
Ditto ditto above low water line	33	—

The tension on the chains is calculated as equal to 991.4143 tons. To sustain this tension, the section of the chains is 256 square inches, and taking seven tons per square inch as the elastic limit of cast iron, the resistance of the chains will equal 1,792 tons, leaving a surplus of 800·6 tons after the calculated strain has been deducted from the real strength of the chains.

Overflowing of the Rhone.—The causes of the late inundation are thus explained in the French journals. The meteorological observations made in the city of Lyons give as the measure of the rain which fell there during the 27th of October, and six following days, 32 centimetres and 4 millimetres, or rather more than 12 1-8th English inches. The yearly average at Lyons being 54 centimetres, or 21 1-10th inches. To this phenomenon was added a burning southern and south-west wind, which prevailed during three weeks in the upper Alps, melting immense masses of snow, which sent down their fatal tribute.

Operation for the cure of Squinting.—The numerous operations that have been performed for the cure of squinting, increase so rapidly, and have been so successful, that it may be hoped this defect will in a short time be universally remedied; independently of the operations of M. J. Guerin, M. Roux, M. Bauden and some other surgeons in Paris, M. Philips has just performed a great number of operations in presence of many physicians, with remarkable skill and very satisfactory results, the system adopted is that of M. Dreffenbach, very successfully modified by Doctor Philips.—*Journal des Debuts.*

Irish Antiquities.—A few days ago, a farmer discovered in a bank in a bog, in the townland of Kinuigo, near Armagh, a beautiful antique bulla. It is nearly the shape of a heart, and is made of fine gold. The back and front are without ornament, but the sides are covered with fine twisted wire, ending in loops at the top. Along with it he found a spear-head, having a socket and holes for rivets,—a celt, with socket and loop,—and two rings of cast brass, a large and a small one, linked together. They are all in high preservation, and have been added to the collection of Mr. Corry, Armagh.

VARIETIES.

Use of Chloride of Lime in removing the Smell of fresh Paint.—In the room which is to be submitted to the action of the chloride, there are placed planks three feet in length by two in breadth. On these planks is spread some hay slightly moistened. The hay is sprinkled with chloride, and left for some days, taking care to keep the room closed. The decomposing action of the carbonic acid in the air, causes the chlorine to exude from the chloride of lime, which, being diffused in the room, destroys the smell of paint. If the damp is required to be absorbed at the same time, pounded muriate of lime is placed on plates or in earthern vessels, pieces of chloride of lime or of muriate of lime pounded, which, having an affinity to moisture, attract the water from the atmosphere and becomes liquid. The same result may be attained by the use of chlorine. The operation is effected in the following manner:—A small earthern vessel is placed in the middle of the apartment; it is placed on a heated brick or on a small furnace, containing very little fire; in this vessel is afterwards put an ounce of oxide of manganese and three ounces of hydrochloric acid. The mixture must be stirred with a glass tube, and the windows and doors kept shut for four-and-twenty hours.

To Clear Water for Cutinary Purposes.—Take a lump of alum, the size of a large nut, or half a walnut, place it in a jug, and fill it with boiling water, and when dissolved stir it well. The contents, if plunged in a cask of twelve or sixteen gallons of water, will, in a short time, cause the muddy qualities to separate, and precipitate to the bottom, while the water will not have imbibed any injury from the alum.

Homœopathie Institution for Poslerity.—A citizen of Konigsberg, lately deceased, has left 25,000 thalers (125,000f.) to be placed out at interest, which is to accumulate for 250 years, and then to be employed in the founding of an homœopathic establishment. He has named a physician for the proposed foundation, whose salary of 2,000 thalers is to begin at once.

Export of Manufactured Goods to the United States.—The export of manufactured goods to the principal ports in the United States is now more extensive than it has been at any period for the last 12 months. The packet-ship England, which sailed on Wednesday for New York, and the packet-ship Garrick, for the same port, had freights amounting to nearly £1,300 each. The Susquehannah, which sailed on Wednesday for Philadelphia, had a full freight; while the traders to Boston and Baltimore fill well.—*Liverpool Albion.*

Explosion in Blasting.—We are sorry to have to record the death of another individual at the Box Tunnel. The poor fellow was engaged in ramming the powder for blasting the rock, when a spark from the tools he employed ignited the powder, which caused his death. Strange to say, there were two or three others standing close by, who escaped unhurt.—*Willshire Independent.*

Mill Accident.—On Wednesday, as an engineman, named John Hardeastle, in the employ of Messrs. Taylor and Duffield, Oatlands Mill, near Leeds, was engaged in greasing some part of the machinery, his right arm became entangled with a strap, and he was whirled round by a wheel making one hundred revolutions per minute. Some persons were near, and the machinery was stopped, though not before the arm of the poor man was torn off from the shoulder.—*Leeds Mercury.*

Opening of the Hartlepool Docks.—The town of Hartlepool was on Monday the scene of great rejoicing, in consequence of the opening of the Wet Dock. The works have been completed at the cost of a public company, under Act of Parliament, the capital stock being held in shares. The shareholders in this concern are about 230 in number; at one time, their shares were as low in the market as under £50, while, at the moment we write, they are in demand at £160. Such is the reward of perseverance combined with sound judgment. The gross receipts of the company are now about £3,000 per week, or £156,000 per annum. The works were commenced in the autumn of 1832. It was first intended, that a tide harbour, of 20 acres area, and *two* wet docks connected with it, one of 7¾ acres, and the other 7¼, should proceed and be completed simultaneously; but before the next meeting of proprietors in June, 1833, the directors had thought it expedient that the tide harbour should be completed first, in order that the works might be brought into beneficial operation as early as possible. The tidal harbour having been completed, the outer works were then proceeded with. The wall which surrounds this excavation, except at some places on the east side, where there are sloped embankments for landing timber, is about 30 feet high, and composed of 24 courses of masonry. On the side next the tide harbour, it is 2,000 feet in length, at the north end 271, and at the south-east 493. The area is nearly 20 acres, and the depth of water will at all times be from 20 to 23 feet; along three sides is ample room for quays, warehouses, &c., while the fourth is to be occupied by coal-drops. Seven drops are now at work on the tide harbour, and two on the dock. The entrance lock to it is 45 feet in width, and 210 feet in length; and the dock itself will constantly contain from 23 to 25 feet depth of water, being ample for permitting vessels of all burdens to lie afloat. The tide harbour is of equal area; and behind that, is the great scouring reservoir of the Slake, which covers about 180 acres. Along the wet dock is a line of nine mooring-buoys, besides a buoy opposite the entrance from the tide harbour. It is calculated that each acre of water will amply accommodate at least ten ships of average size.—*Tyne Mercury.*

Scientific School for Engine Drivers.—The directors of the Polytechnic Institution have announced the establishment of a much-wanted school, for the proper instruction of mechanics to whom is committed the serious and most important duty of locomotive-engine driving. It appears they have appointed a professor to instruct the men in everything connected with steam-power and steam-engines, and that a practical and experienced engine-driver has also been engaged, to demonstrate in the technicalities and phraseology of his class. Extensive apparatus, in the shape of sectional and working models, has been provided for the use of the pupils, by the aid of which, with the assistance of their instructors, they may become perfectly qualified to conduct and manage trains without the liability to accident which has been lately exhibited to an alarming extent.

A rich lead mine has been opened in the manor of William Ord, Esq., M. P., Whitfield, Northumberland. After a perseverance of some years' duration, and an expenditure of about £1,700, the directors of the mine, William Lee and Thomas Clementson, Esqrs., of West Allandale, have succeeded in their object, and are now raising lead ore abundantly, through a judicious system of encouragement to the workmen employed by the company. The speculation, it is now believed, will amply remunerate the shareholders; and we hope that their expectations will be fully realised.—*Tyne Mercury.*

Dreadful Steam-boat Explosion.—The New Orleans papers bring the melancholy tidings of another steam-boat explosion on the waters of the Mississippi, the result of the most criminal neglect of duty. The flues of the steam-boat Persian collapsed, when near the town of Napoleon, killing and scalding from thirty to forty persons, consisting of the deck passengers and some of the crew. The whole of the cabin passengers escaped uninjured. Four men died immediately at the time of the collapse—seven died next day—four more are missing, and there were some fifteen or twenty others whose lives were despaired of. The captain was asleep at the time of the fatal explosion, and the firemen state that the pilot was intoxicated. The boat had stopped at a wood pile some short time before the collapse, but no steam was let off. To a surcharge of steam the catastrophe is attributed.—*New York Paper.*

The Lake of Haarlem.—The King of Holland has just authorised the raising of an additional loan of three millions of florins for draining the Lake of Haarlem.

Skylarks.—On Thursday prodigious flocks of these birds were to be observed throughout the day flying over the villages of Totteridge and Finchley in a southernly direction, wending their course, no doubt, to the sea-coasts in quest of food and shelter. Skylarks invariably roost on the ground, and are never known to perch or settle on trees, so that when the snow lies deep on the earth they are unable to a obtain a roosting-place in the fields, which, with the inability of procuring food, compels them to shift their quarters. The migration of these birds has ever been regarded as a sure and infallible prognostic of a Siberian winter, for they are never known to quit their accustomed stubbles, and seek another latitude, but when instinctively conscious of the absolute necessity of migrating.

Adelphi Theatre.—A series of scenes, forming a dramatic representation, and entitled *A Vision at St. Helena*, was brought out on Monday evening at this theatre. It represents the vision of a soldier who is guarding the tomb of Napoleon at St. Helena. The apparition of the deceased Emperor, which is remarkably well personated by Mr. Yates, both in costume and countenance, appears to the soldier, and informs him that his ashes are about to be removed to France. The interior of the Hotel of the Invalids at Paris is represented, and the ceremony of the reception of the ashes, &c. There is a very beautiful view of the islands of St. Helena, and the arrival of the ships from France. The whole is well got up, and occupies but a short half hour. It was well received by the audience.

ADVERTISEMENTS.

MESSRS. BOOTH & CO's, OF HANLEY, STAFFORDSHIRE, SUPERIOR CHINA AND STONE WARES.—Messrs. G. R. Booth and Co. have deposited for sale their new Chiua and Stone Wares at the following dealers in town.

Their Globe Jugs and Breakfast Ware of the ultra-marine color, are the nearest imitation of that celebrated Pigment that has yet been made by the potter's art—and cannot be had from any other manufacturer. The shapes and forms of their jugs, &c., are purely classical in design and ornament; being an endeavor to revive the highly cultivated taste of the ancients in articles for domestic use. Their Samian (body) pottery, especially in jugs (No. 316), with the Etruscan varnished patterns, is a successful representation of the celebrated and imperishable varnish of the Etruscan wares (as seen in the British Museum)—the arts for doing which had been lost for the last two thousand years. Their stone water goglets, or bottles, possess properties peculiar to their composition; they are useful for the sideboard and the toilet-table, having many advantages over glass—for, being non-conductors of heat, water will be kept much cooler in them than in glass, and will sustain its purity much longer, and therefore keep the water more congenial to health.

The time and expense that has accrued to bring these articles to their present state of perfection, has caused the manufacturers to enroll their porcelains according to the law respecting new inventions. They can only be sold, therefore, by the following dealers, and such others as the manufacturers may appoint. The quantity also is limited, from the difficulties attending their manufacture. They may be purchased of

Mr. C. Brown, China Warehouse, Oxford-street.

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27 Geo. III., c. 38; 2 Victoria, c. 13; 2 Victoria, c. 17. (The last relates to patterns and *models.*)

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2 and 3 Victoria, c. 67.

Sculptures,—
38 Geo. III., c. 71.

Engravings,—
7 Geo. III., c., 38; 17 Geo. III., c. 57.

Copyright,—
8 Anne, c. 19: 12 Geo. II., (Booksellers' Act), c. 36; 5 Geo. III, (Universities' Act), c. 53; 54 Geo. III. (General Copyright), c. 156.

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Mining Journal Office, 37, New Broad-street, City, 27th June, 1840.

NEW WORK ON THE IRON TRADE.

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THE

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AND JOURNAL OF INDUSTRY;

A WEEKLY BRITISH AND FOREIGN MISCELLANY OF

SCIENCE, INVENTIONS, MANUFACTURES, & ARTS.

No. 74.] SATURDAY, DECEMBER 26, 1840. [PRICE FIVEPENCE STAMPED. CIRCULATING FREE BY POST.

THE ADVANTAGES OF WORKING STEAM-ENGINES EXPANSIVELY.

The great saving of steam-power in working steam-engines expansively, instead of employing steam of the same elastic force as that in the boiler through the whole stroke, has long been acknowledged; yet the principle is far from being generally adopted. That method of working has hitherto been, for the most part, limited to condensing engines, and even in these but to a very small extent; though it is equally applicable to engines without condensers, and presents many peculiar advantages, in addition to the saving of power.

We recently quoted from the transactions of the Institute of Civil Engineers an abstract of a paper by Mr. Josiah Parkes, in which he stated the work done by Cornish engines to be so much greater than the ordinarily-estimated duty of the steam used, that he was induced to seek for other causes than the elastic force of steam alone, to account for such an amount of work being performed. He was induced to attribute the effect to the impulsive, or, as he terms it, the "percussive" force of steam rushing into the cylinder. We have, in a preceding number, stated the reasons which induce us to conclude, that no additional power can be gained by the impulse of steam rushing into the cylinders, and that the cause of the effect must be sought elsewhere. We shall now endeavour to show that, in the action of steam engines worked expansively, there must be a great saving of steam power, which is fully adequate to account for the additional quantity of work done, without looking further for the cause than the elastic force of steam.

Let us suppose the cylinder of the steam-engine to be of such diameter that the area of the piston presented to the action of the steam is equal to 1,000 square inches; and that the pressure of the steam in the boiler is 20 lbs. to the square inch. We will suppose the condensation to produce a uniform partial vacuum of ten inches of mercury. In such circumstances, the pressure acting on the piston will be 30 lbs. to the square inch—that is, 20 lbs. for the elastic force of the steam greater than the pressure of the atmosphere, and ten pounds per inch gained by working with a partial vacuum, on the other side the piston, of only ten inches of mercury, which is equivalent to another ten pounds of pressure. The total working pressure on the piston would, therefore, be 30,000 lbs. We will suppose the stroke of the piston to be four feet; and consider, in the first place, the quantity of steam used and the amount of acting force when the full pressure steam is employed. To raise the piston one foot would require about seven cubic feet of steam; consequently to complete the single stroke there would be required four times that quantity, or twenty-eight cubic feet. The total acting force on the piston would be equal to 30,000lbs. raised four feet. When the eduction valve is opened, the whole of the acting force of this high pressure steam rushes into the condenser, and is wasted; and when the engine is worked rapidly, the steam cannot be condensed sufficiently to keep up the vacuum on the other side the piston. We have thus twenty-eight cubic feet of steam, which is capable of doing a vast quantity of work, absolutely worse than wasted; for its elastic force is partially acting against the return stroke. Now, instead of allowing the steam to enter the cylinder to the completion of the stroke, we will suppose that the supply is cut off, by shutting the valve, when only half the stroke is completed. The quantity of steam employed will then be only half, but we shall find that the amount of force exerted on the piston will be not very far short of what it was when double the quantity of steam was used. The steam admitted will continue to expand—so long as the resistance is less on the other side the piston—just the same whether it be in direct communication with the boiler, or not. The force, will, it is true, be gradually diminishing as the steam expands; and when the piston has arrived at the top of the cylinder, the pressure will be diminished one-half; though it continues still to be acting with the same advantage gained by the partial vacuum from the condensation on the other side the piston. For instance, the direct pressure of the steam as compared with the pressure of the atmosphere would, at the end of the stroke, be ten pounds on the square inch, and as the vacuum of ten inches of mercury would give the advantage of another ten pounds, the force acting on the piston at the end of the stroke would be twenty pounds on the square inch. But this would be the *minimum* amount of pressure. To ascertain the average pressure on the piston during the two last feet of the stroke, after the steam is cut off, we must take the amount of pressure at the end of the first foot. That pressure would be fifteen pounds to the square inch, which, added to the gain by the vacuum, would give an average force of twenty-five pounds to the square inch after the steam has been cut off. That is to say, there would be a total acting force on the piston of 25,000 lbs. for two feet, entirely saved by working the steam expansively.

When worked with full pressure steam throughout the whole stroke of four feet, it was shown that 30,000 lbs. were raised four feet by a consumption of twenty-eight cubic feet of steam. When worked expansively the total weight raised would be 30,000 lbs. lifted two feet, and 25,000 lbs. two feet, equal to 27,500 lbs. raised four feet, with only half the quantity of steam. Thus we perceive what an immense saving of steam power must result from this mode of working the engine; and that the ordinary calculation of the duty of any given quantity of steam, will not apply when it is thus made to do double work.

Supposing the steam to be cut off at quarter stroke instead of at half, in the same engine, the advantage would be still greater. The expansive force of the steam at the end of the stroke would, indeed, be reduced from twenty pounds the square inch to five, but it would be acting against the same partial vacuum on the other side the piston, so as to produce, even at the termination of its action, a combined pressure of fifteen pounds on the square inch. The average pressure in the piston during the three feet after the steam was cut off, would be about eight pounds the square inch, and ten pounds for the vacuum, being together equivalent to a pressure of 18 lbs. on the square inch, or 18,000 lbs. on the whole area of the piston. The work done by the full pressure steam admitted during the first foot the piston was lifted would be to raise, or to overcome the resistance of, 30,000 lbs. for one foot; the work afterwards performed by the expanded steam (which would in the ordinary mode of working be entirely lost) is to raise 18,000 lbs. for three feet.

The total amount of work done in the three cases we have supposed is, therefore, as follows:—When the engine is worked with full pressure steam throughout the whole stroke, 28 cubic feet of steam would raise 30,000 lbs. for four feet, which is rather more than 1,000 lbs. raised four feet by one cubic foot of steam. When the steam is cut off at half stroke, half the quantity of steam of the same

density would raise 27,500 lbs. the same height. And when cut off at quarter stroke, seven cubic feet of steam would raise 21,000 lbs. four feet; which is 3,000lbs. raised four feet by one cubic foot of steam. We thus perceive that, in the latter case, the work done by one cubic foot of steam of the density of 20 lbs. to the square inch, is nearly trebled when worked expansively at the quarter stroke.

There must, however, necessarily be limits to the extent to which this principle of working is carried. As the friction of the machinery is fully equal when the smaller force is employed to what it is when full pressure steam is used throughout, there will, in that respect, be a loss of working-power when the steam is employed expansively. The determination of the extent to which the plan can be carried, is to be decided by practice alone. That great advantages must be derived from a proper application of the principle is, however, evident from the preceding consideration of the subject; and it seems strange that this principle, which is admitted to be good, should not be universally adopted—in condensing engines at least. In high-pressure engines the gain would not be so great, because the expanded steam has to act against the pressure of the atmosphere; but even in these engines it would effect a great saving, besides being, as we stated in a former article, peculiarly valuable in locomotives, where a variation of power is required to overcome varying resistances.

IRON MANUFACTURE OF FRANCE AND ENGLAND.

There is no branch of English manufacture which seems to excite so much jealousy on the continent, and in which their inferiority is so generally admitted, as iron manufactures and machinery. The great capital required to establish an iron-foundry and works on the large scale which is best adapted for producing the iron economically, renders it difficult, even were other circumstances the same, for the continental manufacturer to enter into competition with the English iron, either as to quality or price. In a French publication, *L'Ancre*, devoted more particularly to metallurgy, this subject is often mooted, and plans are from time to time proposed with a view to remedy the defects of the manufacture of iron in France, and to place it on an equality with that of England. It is true that in some respects France possesses the advantage over this country. Her extensive forests furnish an almost inexhaustible supply of charcoal at a moderate price, and enable the founders to work in that respect with a fuel better suited to the manufacture of the best iron than mineral coal. The foreign founders, however, have for the most part blindly followed the process adopted in this country, as far as they were able, and have used coal, though charcoal, which would have suited their purpose better, is abundant, and in many places cheaper. They are now beginning to take a more enlarged view of their own capabilities, and several able writers have endeavoured to rouse the attention of the iron masters of France and Belgium to the improvements that might be effected in their manufacture of iron, by availing themselves properly of their own resources; by adapting their processes of manufacture to their peculiar circumstances; and by not following the track of those who are working in some respects to greater disadvantage than themselves.

In this view a paper, written by M. Deniset, sen., mechanical engineer, has been published in the *Ancre*, for the purpose of showing, that by adopting the mixed process of manufacture, by hammering and rolling the iron as it comes from the furnace, similar advantages may be gained to those acquired by the rolling alone; which process, to be carried into effectual operation, requires extensive machinery and large steam power; that can be obtained only by a few of the iron-masters in France. It is well known, he observes, that the more iron is rolled, beaten, and stretched, it becomes more soft, strong, and homogeneous, and is in consequence less brittle. "The English putting into practice this well-known truth in their modern metallurgical operations, after the puddling process, stretch it out under compressing cylinders. They then cut the bars into short lengths; make with these lengths bundles placed one on another; weld them together in the reverberatory furnace; and again draw it out under the powerful cylinders. Thus the bars of the ordinary size are made from twenty-five to fifty times the length of their first form; by which means the superior quality of the rolled iron in toughness and uniformity of grain is obtained. Those works where the iron is thus rolled require large capitals for their construction, for their working, and for the attainment of perfection in the manufacture. It is also well known that those founderies only which work on a large scale are profitable. It is necessary, therefore, in order to work the large cylinders, that there should be either a powerful fall of water, or a large steam-engine. The first kind of motive power is scarce; the second is expensive. We are led, therefore, to inquire, whether by the mixed method, such as it exists in our country, it would be possible to work with water power, to dispense with steam engines, and yet to produce iron of a quality equal to that of the rolled bar iron.

"We think this result may be obtained by employing much smaller capital than is required for the rolling works. One pair of rolling cylinders would be sufficient, which would stretch the iron into thick bars. These bars might be cut into short lengths, which might be placed upon one another, to be reheated in the ordinary furnaces. They would then be welded into one mass, and be passed, whilst still heated, under the hammers usually employed, to be stretched into bars; that would be of a far superior quality to the iron obtained by the method in present use. The iron thus made could be warranted of a good quality; and as the hammered iron is for the most part intended to be worked up into various utensils, there is no necessity for the bars being exactly of the same size throughout. In short, this latter property cannot be obtained in the present method of hammering. Our plan would then produce bars of better quality, it would diminish the quantity of time and fuel, with an increase in the amount of iron, and a decrease of the general cost.

"If the bars were required to be exactly of the same size, they might easily be heated to a low red heat throughout their whole extent, by the heat which escapes from the furnace, and then passed through grooves in a pair of cylinders, which might be put in motion by the wheel which works one of the hammers. Thus with two pairs of cylinders put in action for a few minutes in a day only, the mixed forges on the Marne might be converted at a trifling expense into English forges, and would produce iron as good as that of England without addition to the expenses at present required."

These are the principal recommendations proposed in the *Ancre*, but it is admitted by the writer, that unless there is a great alteration in the construction of the furnaces for smelting iron, the improvement effected in the subsequent processes cannot place it on an equality with iron of English manufacture.

FACTORY CHILDREN IN FRANCE.

Our Paris contemporaries have lately had long articles upon the bill for the regulation of child labor in factories. The subject is one of great interest, and at the same time of considerable difficulty, for the line has to be drawn between the real demand for labor and the abuse of those by whom it is furnished. Although in Prussia, Austria, and Bavaria factory labor, as regards children, has long been under the immediate control of the Government, and in England the Legislature has for years taken up the question, and passed bill after bill with a view to harmonise the interests of the manufacturers with what is due to the health and moral instruction of children, no legislative restriction has hitherto been imposed in France upon the employers or parents of the children who work, by which the cupidity of employers or parents may be prevented from stunting the growth and destroying the health of young persons of both sexes, and excluding them from the advantages of education. Generally speaking the factories in France, in which children are employed in large numbers, are under better regulations than establishments of the same kind in England were previously to the interposition of legislative control. Most of the employers apportion the labor to be performed to the physical means of children, and in many factories the parents are encouraged to provide a certain degree of education for their offspring. There are, however, many exceptions to this state of things. In some districts there are task-masters, who draw so unmercifully upon the strength of boys and girls, that they become old in constitution before they reach the age of 20, and the parents themselves, far from protecting their children against the unreasonable demands of their employers, become willing accomplices in this outrage upon humanity. When children in factories who work by the piece, and this is the case in most factories, exceed the number of hours which nature would indicate, and frequently pass whole nights in labor, the employer is benefited by being enabled to complete his orders within a given period, and to avail himself of the opportunity of meeting with rapidity the sudden demand created by some change in the fashions. The parents of the children, on the other hand, receive a larger amount of payment, and it is by no means unusual to see them, not merely neglecting the moral instruction of their children, but also denying to them the generous food which is required for young persons who are tasked beyond their strength. Those fine feelings which regulate the mind even of the most uneducated in the agricultural districts do not exist to the same extent in the manufacturing districts, where cupidity and vice are alike prominent. There are employers who look upon the persons whom they employ as so many machines, and who calculate the wear and tear of human life as they calculate those of a steam-engine, driving both at their greatest possible rate of speed without snapping. There are persons also who pass a portion of their time in vicious indulgence, while their children are working over-hours, and living on miserable food, to enable their unnatural parents to frequent the haunts of idleness and dissipation.

The object of the bill now before the Chamber of Deputies is to protect children against both masters and parents, where there is an absence of proper feeling in both; and also to protect parents, who love their offspring, from being compelled, by hard taskmasters, to allow their children to work beyond their fair strength, as a condition of their being themselves employed in factories. Another great object of the bill is to make education in all the manufacturing districts indispensable as a means of employment. Children are not to be employed if under a certain age, nor can they be received at all without certificates of their having received a certain degree of education; and masters are to be compelled to set aside a certain period of the day in order that the children whom they employ may

receive moral instruction, and an education fitted at least to their position in society.

All the Paris journals, of whatever color, which notice this subject, express an earnest desire for the speedy settlement of the question in a way which shall promote the moral and physical interests of the laboring population, without improperly interfering with the interests of employers. They are very diffuse in their reasoning, and, generally speaking, pretty correct; but the question is in itself one of such simplicity as well as importance, that our notice of the heads of the bill will be quite sufficient to enable every well-regulated mind to draw its own conclusions. Those who have had the opportunity of seeing what the manufacturing districts of England still are, in spite of all the legislative control which is exercised, may judge of what they would be in France if the manufacturing interest were as extensive as it is in England, without any kind of legislative control over employers, or any protection over the laborers. Some of our contemporaries, whilst they do justice to the anxiety of the British legislature for the laboring classes, and their desire to prevent that physical deterioration of the human race which provides a population for hospitals and workhouses, recommend that the French legislature should not copy the laws of other countries, but profit by the experience which it has had of the operation of the working of them, to select what is good, reject what is evil, and build up a new and efficient system.—*Times.*

CHEMICAL EXPERIMENTS ON ESSENTIAL OILS.

Messrs. C. Gerhardt and A. Cahoms recently submitted to the French Academy of Science, the first part of a memoir descriptive of these experiments on the essential oils. From this memoir we translate the following extract:—

"Essential oils have not hitherto been objects of much investigation. Some of them only have been submitted to a rigid examination; and those experiments have been particularly directed to the difficulties encountered in their purification—in fact, only very few were known capable of crystallization. Most of them are liquids, and consist of mixtures of two and even of three different ingredients, which can seldom be separated by distillation at various degrees of temperature.

"We have undertaken a series of investigations on this class of substances, and since the commencement of our undertaking we have been fortunate enough to discover a very simple process, by means of which the two heterogeneous substances which constitute a great portion of essential oils, can be separated in a state of purity.

"Many chemists have proved the fact, that the essential oils which plants produce naturally, and which are extracted from them by simple distillation, are mixtures, in different proportions, of oxygenated oil and of carburetted hydrogen. The oxygenated oil is sometimes crystallised, while the principle to which it is united is in a liquid state. In this case the separation of the former is accomplished with ease; but it is not so with the carburetted hydrogen, which is uniformly contaminated with a certain quantity of the other product. The process of distillation not being of a nature to remove this difficulty, it was requisite to discover a chemical agent, which, put in contact with an essential oil, retains the oxygenated portion and allows the carburetted hydrogen to escape.

"We have found that potash, in a state of fusion, perfectly accomplishes this object. The application of potash has enabled us to detect the existence of two separate principles in many essential oils; among these our attention has been chiefly directed to three, — cumin, valerian, and camomile. These three essences each contain an oxygenated oil that is converted by potash into an acid; and a carburetted hydrogen, on which this subject produces no effect. The carburetted hydrogen of the essence of valerian is changed into common camphor by the action of the nitric acid.

"We shall now make known the conclusions to which we have been led from our examination of the essence of cumin. Our investigations of the two other essential oils are sufficiently advanced to quickly succeed this first report.

"Essential oil of cumin pre-exists in the grain of that name. It is not, like the essences of mustard and bitter almonds, the consequence of the action of water on certain principles which constitute the grain. To assure ourselves of this fact, we have tried it successively with water, with anhydrous alcohol, and spirits of hartshorn; and these different methods have continually furnished us with the same oil. It contains two principles: one of them, oxygen, is the foundation of interesting experiments, which have the greatest analogy with the experiments that have been made of late years, consequent on the study of the essence of bitter almonds. This substance creates, by the action of alkalies and by the action of oxides in general, a particular kind of acid, which can easily be procured in a state of crystallisation. The preparation of this new acid is made with such rapidity, that in less than an hour a kilogramme can easily be produced.

"The two principles which constitute the essence of cumin are capable of being converted into a remarkable variety of substances."

ON THE EFFLUX OF GASEOUS FLUIDS UNDER PRESSURE.

BY CHARLES HOOD, F.R.A.S., &c.

The theoretical determination of the velocity with which gaseous fluids are discharged through tubes and apertures, has frequently been investigated by mathematicians; and as the question is one of importance in various branches of practical science, the author examines the several theorems which have been proposed for its elucidation, and compares them with the results obtained by experimental researches.

Dr. Papin, in 1686, appears to have first ascertained the law of efflux to be the same for both elastic and inelastic fluids, and the majority of the writers on the subject since his time have adopted as the fundamental data of their calculations the hydrodynamic law of spouting fluids, by which the velocity of discharge is found to be proportional to the square root of the height of the superincumbent column of homogeneous fluid.

The author investigates particularly the methods of calculation proposed by Dr. Gregory, Mr. Davies Gilbert, Mr. Sylvester, Mr. Tredgold, and M. Montgolfier, and points out the differences which exist in their several methods. That of Mr. Sylvester is the only one which differs in any considerable degree from the simple law above stated; and his calculation is based upon the supposition that the respective columns of light and heavy air represent two unequal weights suspended by a cord, hanging over a pulley—by which mode of calculation, in the cases selected by the author for comparison, a result is obtained of only about one-third the amount given by the other methods. These calculations are compared with some experiments made by Sir John Guest, at the Dowlais Iron Works, and also of Mr. Dufrenoy, at the Clyde and at the Butterley Iron Works, recorded by him in his report to the Director-General of Mines in France. The results are tabulated, giving the pressure of the blast, the area of discharge, the velocity of the blast, the quantity of air ascertained by experiment, and the quantity shown by the several methods of calculation. From all these comparisons, the author draws the conclusion that the method of calculation proposed by Montgolfier is the most accurate, as it is also the most simple. If the pressure be ascertained in inches of mercury, it is only necessary to find the column of air in feet equivalent to the pressure, and to multiply this number (as in the common case of gravitating bodies) by sixty-four feet, and then the square root of this product will give the velocity of discharge in feet per second. The equivalent height of the column of air in feet is found by multiplying the number of inches of mercury by 11,230, and dividing the product by 12—mercury being 11,230 times the weight of air. Allowing for a small loss by friction in the quantity found by experiment, the agreement between the theoretical and experimental quantities is extremely near. Rules are likewise given for applying these calculations to other gases of different specific gravities, which are also applicable to chimney draughts and to the expansion of air by heat. —*Trans. Inst. Civil Engineers.*

THE PUBLIC HEALTH.

It has been clearly established that there is a much higher rate of mortality in towns than in the open country. During the first half-year of registration the difference between the diseases in a dense and scattered population was remarkable. Is this discrepancy of a transitory, accidental, or permanent character? Mr. Far states that the year 1838 afforded unusual facilities for solving this problem.

The population of the city districts, in 1830, is estimated at 3,726,221, and that in the counties at 3,539,908. The city was to the rural population as 1·053 to 100; and to this extent (5 per cent.) the deaths in the counties should be augmented to render the mortality strictly comparable.

The excess of deaths in cities, besides the 70,410 who died equally in the dense and in the more scattered populations, was 30,609; 9,970 from epidemic maladies, 7,474 from diseases of the nervous system, 10,465 from affections of the organs of respiration, and 3,144 from diseases of the digestive apparatus. The annual rate of mortality in the cities was 2·7 —in the counties 2·0 per cent.; and the mortality in the cities 1.36 to 1.10 in the counties. The mean duration of life in the two sets of circumstances would differ nearly in the ratio of 37 years and 50 years. In order to arrive at a correct conclusion as to the relative amount of disease in cities and counties, it will be necessary to examine in each department an extent of country embracing the same amount of population. This course Mr. Far has adopted, and the following is the result of his observations:—The diseases that are most prevalent in crowded cities are asthma, erysipelas, convulsions, and teething; inflammation of and water in the brain; inflammation of the lungs, air-tubes, and pleura; *delirium tremens*, or drunkard's delirium; typhus fever, small-pox, heart disease, affections of the liver, rheumatism, gout, hernia, and the diseases incident to parturition.

In the cities the mortality is less in the following cases:—consumption, croup, violent deaths, mortification, stone, apoplexy, malformations, hemorrhage, &c.

It appears that those chronic diseases, in which there are new deposits, new formations, or new secretions, prevail to as great an extent in the country as in cities. This class includes scrofula, cancer, jaundice, diabetes, &c.

Parturition is 63 per cent. more fatal in town than in the country, in consequence of its being more frequently followed by a disease which annually destroys many valuable lives—viz., puerperal fever.

All injuries are more fatal in cities than in the country. The surgeons in the rural districts trust more to the resources of nature than to the results of operations; and when it is deemed necessary to mutilate the body, the patient has a better chance of surviving the effects of it. In the metropolis, and in many of our provincial towns, the chance of recovery in these cases is lessened by the patient being exposed to the crowded and often impure air of an hospital.

That the mortality should be greater in densely populated districts than in places where the inhabitants are scattered, and have the advantage of inhaling an uncontaminated atmosphere, *à priori* reasoning would have led us to conclude.

Atmospherical variations materially affect the duration of human life. The reduction of temperature alone is fatal to many persons. Winter is supposed to be most fatal to the inhabitants of a

city on a favorable site, furnished with sewers, or to an agricultural population occupying a dry soil; and summer to the inhabitants of marshy districts, or of cities in which the refuse organic matter is exposed to putrefaction. In proportion as the severity of the weather or malaria preponderates, the winter or summer will be the unhealthiest season.

In England summer is the healthiest, and winter the most fatal, season. This rule has prevailed in this country since the beginning of the last century.

In the winter of 1838 the deaths were 15,611; in spring, 13,109; in summer, 11,397; in autumn, 12,581.

The following diseases were rendered more fatal by the influence of cold during the winter of 1838:—paralysis, apoplexy, asthma, diseases of the head, influenza, inflammation of the lungs, air tubes, and pleura, &c. The cold carried off many old people.

Consumption destroyed the greatest number in spring. Males suffered from the disease in winter more than females. Diseases of the digestive organs and nervous affections prevailed to a great extent in summer.

The most appalling fact that the registration tables of 1838 bring under our notice is the great increase of the number of deaths from that pestilential scourge the small-pox. It is, indeed, alarming to contemplate the mortality which prevailed from this disease alone.

"When the Registration Act came into operation," says Mr. Far, "the epidemic of small-pox had commenced and was rapidly advancing."

The epidemic destroyed more than 30,819 persons. When the small-pox does not prevail epidemically, it is calculated that only 5 die weekly of the disease in the metropolis. The problem for solution is, as Mr. Far justly observes, why do the 5 deaths become 10, 15, 20, 31, 58, 88 weekly, and then progressively fall through the same measured steps!

Of the laws which regulate the course and modify the character of epidemic diseases we know little or nothing. That the contagion of small-pox is readily diffused in certain states of the atmosphere is an undoubted fact, but the constitution of the air which appears to favor its propagation is neither appreciable by the thermometer, the hydrometer, nor the barometer. It may, as Dr. Gregory suggests, be dependent upon some electrical condition of the air which has hitherto eluded the researches of philosophers, but which time and closer observation may eventually succeed in discovering.

It has been supposed by some that epidemics are caused by the generation of minute insects, which are transmitted from one individual to another; but this hypothesis is devoid of anything like the semblance of facts for its support. The most rational modes of arresting the progress of this fearful malady is, first, by making vaccination more general than it is, and secondly, by doing our utmost to remove those causes which experience informs us predispose the system to the influence of contagion. That the small-pox and many other fatal diseases should make such rapid strides in districts inhabited by the poorer classes of the community need excite but little astonishment. Few have such opportunities of investigating the degraded and miserable condition of the poor in this metropolis as the members of the medical profession. Callous, indeed, must be the hearts of those who can look upon the sufferings to which thousands of our fellow creatures are exposed, particularly during the inclement seasons of the year, without feelings of intense emotion. Deprived of the common necessaries of life, destitute of clothing to protect them from the piercing cold, friendless, forsaken, contemned, thousands are doomed to perish annually in a city which is designated as the centre of European civilisation!—*Times.*

BRITISH PATENTS.

ENGLISH EXPIRED PATENTS.

JOHN GREGORY HANCOCK, of Birmingham, manufacturer, *a new elastic rod for umbrellas and other like purposes*, Dec. 21.

VALENTINE BARTHOLOMEW, of Great Marlborough-street, gent., *an improvement in shades for lamps and other lights*, Dec. 21.

THOMAS MORRISSON, of Vale Grove, Chelsea, *a method or process of rendering boots, shoes, and other articles waterproof*, Dec. 22.

DAVID REDMUND, of Greek-street, Soho, engineer, *improvements in the construction and manufacture of hinges*, Dec. 22.

SPECIFICATIONS OF ENGLISH PATENTS.

ENTERED AT THE ENROLLMENT OFFICE.

(*Continued from page* 389.)

JOSIAH CHRISTOPHER GAMBLE, of Saint Helens, Lancaster, *improvements in apparatus for manufacturing sulphate of soda, muriatic acid, chlorine, and chlorides*, July 3.—Claim first.—The use of iron retorts worked in connection with each other.

Claim second.—The use of iron retorts worked during the process through a door left open, or partly so.

Claim third.—The use of receivers so arranged that the acid can flow or pass from one to the other, and which flow can be regulated at pleasure.

A furnace, consisting of two chambers, is raised upon six brick walls in such a manner that the fire may circulate between the walls, and all over the bottom of the chambers. The entrance to these is closed by iron sliding doors. A quantity of salt is thrown into one chamber, and the temperature raised to about 250 Fahrenheit. Sulphuric acid is then admitted through a pipe at the top of the furnace (acid of 1750 specific gravity is preferred). The whole is then stirred through a hole in the bottom of the iron door, until the mass has become solid, when it is pushed by means of a proper instrument through an inclined doorway into the second chamber, which is kept at a uniform red heat. It is there constantly stirred or moved about by a rake, until all the gas contained therein has been expelled, when the residuum is carried away in iron wheel-barrows. The expelled gas passes from both chambers or furnaces through short pipes into a main, and from thence into a series of receivers, which we will proceed to describe. These are three in number, and placed one above another. Each one contains a cock made of earthenware; they are all filled with broken glass or silicious pebbles, which are large at the bottom and decrease in size towards the top of each receiver; a cistern, with a stop-cock, is placed over the upper receiver, through which the water runs into the lower ones, after they have received the acid; and by varying the quantity of water allowed to pass through the second and third receiver, muriatic acid of any strength may be obtained.

Claim fourth.—The use of earthenware stills enclosed in iron casings and heated by hot water, saline solution, or steam.

Claim fifth.—The mode of changing the receivers, by which means the lime partly saturated with chlorine is exposed to the action of the strongest gas, and the remaining gas exposed to a fresh surface of lime.

Four earthenware stills are constructed with leaden tops; these are enclosed in casings of cast iron, leaving a space of about three inches all round for holding the hot water by which they are heated: each still has a pipe leading to a main, which main communicates with the changing receivers, which are for the manufacture of the chloride, and the stills for the liquid chlorine.

CHARLES GABRIEL BARON DE SUARCE, of Red Lion-square, Colonel in the French service, and WILLIAM PONTIFEX, of Shoe-lane, brass-founder *invention of a new mode of obtaining dye, color, tannin, and acids, from vegetable substances*, June 12.—Claim. The method of obtaining color, tannin, and acids, from substances containing the same, by placing those substances in a finely-divided state into an apparatus as hereafter described, and forcing water or other suitable liquids through them at a proper temperature.

The apparatus used for this invention consists of a cylindrical vessel having a false bottom, which is perforated all over with small holes, and which is fixed so as to form a separate chamber in the vessel. To one side of this chamber an ordinary force pump is fixed, and to the other side an air vessel with a safety valve. A beam is run across the top of the vessel supported by brackets and fixed by pins or bolts; through this beam passes a press screw, which is fixed to a cover, fitting the interior of the vessel, and perforated like the false bottom. For extracting dye or color the bolts are first taken out, the cross beam, screw, and cover are then removed, and the substance from which the extract is to be obtained placed in a finely divided or powdered state in the interior of the vessel over the false bottom. The cover with the screw and cross beam is then replaced, and will rest on the substance just deposited, which is slightly compressed by the screw; and then water from the force pump underneath forced through at a temperature of 160 Fahrenheit, the pressure of which is regulated by the air vessel and valve, and then dye or color is obtained. The same apparatus is employed in the same manner for obtaining tannin or acids, only a "Sicily shumack" is introduced with the material in the cylindrical vessel, and the water or other liquid is forced through at a temperature of 190 degrees Fahrenheit.

G. H. MANTON, of Dover-street, Piccadilly, gunmaker, *improvements in fowling pieces*, Feb. 2.—These improvements consist in constructing and applying a circular magazine filled with copper caps, one of which is continually being pressed forward by means of a spring. The cock has a spring piece of metal attached behind that part which spikes the cap, of an inverted fish-hook form. To the lower part of the cock there is a projection, and at the back of the breech of the barrel there is also a projecting piece. The magazine is nearly circular, having a short neck to which a sliding piece of metal is adapted and held by a spring. In the lower part of the magazine there is a hollow formed, in which the projection on the lower part of the cock works. In the act of cocking the piece after a discharge, the remaining portions of the exploded cap are removed by the spring piece on the cock; and immediately afterwards the neck of the magazine is brought down on the nipple, which motion causes the spring holding the slide to come against the projecting piece at the breech, and allows of a new cap to be supplied; the neck of the magazine being turned out of the way by the descent of the cock when the piece is again discharged.

CHARLES BARWELL COLES, of Allsop-terrace, Middlesex, gentleman, *improvements in the method of fixing and carrying fire-arms on horseback*, Feb. 23.—Claim. The boot, bar, hook, iron, and ring as hereafter described.

An iron plate is fixed to the fore part of the saddle tree, to which plate clamps are rivetted. These are for holding a bar of about eleven inches long, which stands out in a horizontal position, and is bent so as not to impede the free action of the horse's shoulder. A leather boot is constructed about thirty inches long at the back and the front, sufficiently high to reach the lock of the gun. The bottom is of such a size and form as shall hold the stock easily. The boot is fixed by the back at the upper part to the bar before mentioned. It may be secured in various ways by straps at the bottom. At the top part a spring hook passes through the back; this takes hold of an iron made of a looped form (and fixed on the gun) in such a manner that it is necessary to press the gun forwards and towards the back of

the boot after depositing it therein, when it is held fast by the spring hook taking hold of the iron loop; and the gun will be held firmly. A cover of leather or other suitable material is adapted to the same, to preserve it from the rain, &c., which after being thrown round is secured by drawing an iron ring downwards, which must be moved in a contiary direction previous to the removal of the cover. Other modifications of the improvements are shown in the specification, by which the gun may either be carried behind the rider, or with the muzzle downwards; but the above description will show the application of the parts claimed.

ENTERED AT THE PETTY BAG OFFICE.

(Continued from page 324.)

THOMAS EDMONDSON, of Manchester, clerk, *certain improvements in printing presses*, Dec. 9.—These machines are for printing railway tickets so as to print a separate number on each ticket. At the back of the machine a tube or chamber is fixed for holding the blank tickets. A set form of type is fixed with its face downwards (and to which an adjusting screw is fitted); this is placed just before the bottom of the tube or chamber; in front of this form are two printing cylinders, to each of which a racket wheel and pall are fixed. On the faces of these cylinders are figures varying from No. 1 to No. 99; in front of these cylinders is a second tube or chamber, the top of which is just below the level of the bottom of the other. In the upper part of the machine are two pulleys, round which a ribbon takes for inking the type, and which remains between the type and card during printing. These different parts are connected and acted on by a lever handle, to which is also adapted a printing table. On one vibration of the lever handle a feeding lever acts upon a notched feeding bar, so as to bring its front edge against the hindermost edges of the lower blank ticket, and force it forward on the printing table under the set form of type. The fore edge of this ticket presses against the hindermost edge of the last ticket, and pushes it forward under the lowest part of the printing cylinders; this, in running forward, displaces the one that just before occupied that place; which being finished falls into the lower tube or chamber, and the act of pressing the handle downwards moves the table with the ticket upwards and gives the necessary pressure against the type and cylinders. On the lever handle rising to its place one of the cylinders takes a turn and bringa the next number on its surface into the lower or printing position, when the same operation is repeated, and thus ten thousand tickets may be printed, yet all varying in their numbers.

NOTICE TO PATENTEES.

The following is the name of the patentee whose specification will be published in the "INVENTORS' ADVOCATE" on the 27th of February.

James Roberts, of Brewer-street, Sommers-town, due Jan. 18.

AMENDMENT OF SPECIFICATIONS.

In the Rolls' Court, on Tuesday, Lord Langdale gave judgment in the case of Mr. John Sharp's patent for machinery for converting rope into tow. The arguments in the case were reported in the *Inventors' Advocate* on the 14th ult. The case came before the court on the petition of Josiah Wordsworth, praying that the memorandum of alterations in the specification of Sharp's letters patent, and such portions as were, in fact, descriptive of the machinery invented by the petitioner for the same purpose, might be expunged from the rolls of the court. The petition stated that letters patent were granted in the month of October 1836, to Sharp, "for machinery for converting rope into tow," and that the specification of that patent was enrolled in April, 1837. In May, 1838, the petitioner obtained letters patent for an invention "for heckling and dressing flax, hemp, and other fibrous materials," and in the November following the specification was enrolled. The petition then alleged that after this enrolment the petitioner discovered that Sharp had, in the month of September, 1838, obtained from the Solicitor-General a certificate that Sharp had applied for leave to enter with the clerk of the patents a certain memorandum of alterations of a part of his specification, that the Solicitor-General had directed him to advertise the alterations, and that, no objection having been made, the Solicitor-General granted leave to Sharp to file the memorandum of alterations, which alterations the petitioner alleged were a new arrangement of machinery, and extended Sharp's patent to what were, in fact, the petitioner's inventions, as contained in his specification. The petition also stated that the Act of the 5th and 6th of Will. IV., cap. 73, "to amend the law touching letters patent for inventions," did not authorise the addition to a specification of any description of new machinery, and it therefore prayed that the memorandum of alterations might be expunged.

Mr. Pemberton and Mr. James Russell appeared in support of the petition, and Mr. M. D. Hill and Mr. Bacon opposed it.

The Master of the Rolls, in giving judgment, after stating the facts of the case, said that the question was whether he had authority to do that which was asked by this petition, and he was certainly of opinion that he had not. Patents were granted upon the condition that the specification should be enrolled within a limited time, and except there was some clerical error, through inadvertency, he had no authority to make an alteration in the enrolment of the specification. The party enrolling a specification did so at his own peril, and if he afterwards extended it, so as to make his patent invalid, he must submit to all the legal consequences. He thought that, on sufficient evidence, he had authority to correct a verbal or clerical error; but it had never been suggested that the Master of the Rolls, as keeper of the records, had authority to order an erroneous specification to be altered. It was no part of his duty when the enrolment came into his custody to consider whether the Attorney or the Solicitor General had properly exercised their authority. He had delayed giving his judgment for the purpose of inquiring what had heretofore been done with regard to cases of enrolments of alterations in this Court, and it appeared that it was always usual to amend in cases of clerical errors—where the errors were *negligenter, per incuriam, vel ex lapsu calami scriptoris.* Sometimes this had been done by a reference to the Master of the Rolls from the Lord Chancellor—in one instance it had been done by the Lord Chancellor himself, pursuant to an order from the Crown, and sometimes by a writ of Privy Seal, or by the sign manual. In the more recent cases Lord Gifford allowed the word "fire" to be altered to the word "wire.' In the case of Redmond, Sir John Leach corrected an erroneous transposition of letters; and in another case the word "increase" was substituted for the word "inverse." Similar cases had come before him (the Master of the Rolls), and he had never been able to correct more than mere clerical errors. It did not appear that the Master of the Rolls, as keeper of the records of the Court of Chancery, had ever exercised this authority, and, that being his opinion, this petition must be dismissed with costs.

FOREIGN INTELLIGENCE.

FRANCE.

ACADEMY OF SCIENCES.

At the meeting of the French Academy of Sciences, on the 14th inst., the following communications and notices were presented and read.

M. Vallée read a second paper on the theory of the eye. M. Pencelot read a statement of the different communications made by M. Passot, on the motion of liquids and gasses in apparatus called turbines. The commission, after examining the statements of M. Passot, acknowledged that his experiments stated some new facts, but that the opinions with which he supported them were fallacious, and that the effects observed, all of which are very complicated, advance nothing which differs from the mechanical theories generally admitted.

M. Boussingault read a paper entitled "Researches respecting the composition of the sugar of gelatine, and of nitro-saccharine acid." This particular sugar is composed of oxygen, hydrogen, carbon, and azote.

M. Seguier made a favorable report of a machine for making bricks, invented by M. Caville.

M. Chevreul presented from Messrs. Kœppelin and Kampmann, a modification of Marsh's apparatus.

M. Reynault offered himself, by the unanimous consent of the Academy, a candidate for the situation of professor of chemistry at the Polytechnic school, become vacant in consequence of the resignation of M. Gay Lussac.

Dr. Rigal read a paper on a new method, adapted to facilitate the removal of fragments after bruising the stone in the bladder

M. Deville presented a note on the determination of sines of refraction inherent in some bodies in organic chemistry.

MM. Edmond Becquerel and Aay Cuhours presented investigations on the astringent qualities of liquids.

M. Pruvaz, of Lyous, sent some new observations relative to the therapeutic effects of compressed air-baths.

OIL MONOPOLY.

The *Industriel Alsacien* states, that an attempt having been made by certain speculators to monopolise the supply of oil to the manufacturers in that neighbourhood, the masters of the principal manufacturing establishments recently met to consult on the means of resisting this speculation. If we are rightly informed, says the *Alsacien*, the meeting came to the following decision:—That a committee of six members be appointed to supply the manufacturers with oil. That no purchase should be made from the monopolists. Many manufacturers being provided with oil for six, seven, or eight months, others for four or five months, none for less than two or three months, the necessary quantity can be readily supplied even in the greatest emergency, so as to prevent those manufactories whose consumption of oil is the greatest from being obliged to have recourse to the monopolists; these oils supplied by the parties appointed will be sold at prime cost. Montchanen offers to supply 50 boat loads to the committee. Blanzy offers 20 without any increase of price. They only require to be reimbursed for the extra expense that will necessarily be caused by a quicker transport of these oils. Ronchamp offers an immediate supply of 150,000 quintals of the best quality, and 200,000 quintals of the same quality on the 31st of January, independently of a large quantity of oil of an inferior quality, which can be prepared for use when required. With similar resources, and with the unanimous support of our manufacturers, in our opinion the monopolists have not much chance of making their fortune this winter, and when spring arrives they will find that it has not been with impunity that they have been induced by a love of gain to attempt to restrict a great source of national manufacture.

BELGIUM.

When railroads were first established in Belgium it was necessary to have recourse to the experience of a great number of foreign workmen; but the pupils soon became equal to their masters, and the

workshops of Brussels and Malines are now immense nurseries, which put forth most vigorous shoots. Since the plan of railroads on the Continent, which was commenced in Belgium, is becoming universally adopted throughout Europe, not only are the Belgian manufactories resorted to by numbers of philosophers and distinguished manufacturers, but celebrated men from all countries have attended the schools of our engineers and mechanics. Even the nephew of the celebrated Stephenson has not considered it beneath him to spend six months in the workshops of Malines; and not long ago the engineers and managers of the railroad from Dusseldorf and Cologne, &c., went through their apprenticeship in Belgium. While the administration of the Belgian railroads thus initiated enterprising foreigners in the secrets of the art, and gave them lessons of experience, acquired at the price of the greatest sacrifices, it paid immediate attention to every solicitation addressed to it. The best workmen were sent to Mulhausen, to Thun, and to Amsterdam. A recent proof has been given of its desire to extend the plan already carried so far, by sending a skilful foreman of the works and a machinist to Paris, in order to assist in the construction of locomotive engines.

Accounts from Vienna of the 3d December announce the death of the celebrated astronomer De Littrow, director of the Observatory and professor of astronomy at the University of Vienna. The works of M. de Littrow are too well known to require any specific enumeration. He was 60 years of age.

RAILWAY INTELLIGENCE.
DOMESTIC AND FOREIGN.

London, Bedford, and Manchester South Union Railway.—Our readers will see in the following statement the prospect of a railway, through Bedford, that is likely to meet with support from the country through which it passes, between the metropolis and the midland counties, eastward of the Birmingham line; and, at the same time, attain, at comparatively a trifling cost, railway communication between London and Manchester. We refer to the plan of Mr. Holmes, C. E., called the "London and Manchester South Union Railway," which is now before us, intended to unite "the Northern and Eastern Railway," commencing near Broxbourne and Hoddesdon, and traversing by or near the towns of Ware, Hertford, Stevenage, Hitchin, Sheffard, Bedford, Higham Ferrers, Wellingboro', Kettering, Market Harborough, and Leicester, a few miles north of which latter town it falls into "the Midland Counties Railway," by which, and the "Churnet Valley line," the distance between London and Manchester is reduced to about 175 miles; the distance now, by the "Birmingham and Grand Junction Line," being about 220 miles. An important feature in this plan is, that a London terminus is dispensed with.—*Bedford Mercury.*

The North Midland Railway.—We are glad to hear that the directors of this company have reduced the fares from Sheffield to several stations on the line. We are sure this will give much satisfaction to the public, and that the company will find the change beneficial. They also commenced yesterday to book through from Sheffield to Wakefield, Horbury, Dewsbury, and Cooper Bridge, on the Manchester and Leeds line, the nearest points to Huddersfield and Halifax, and at reasonable fares.—*Sheffield Iris, of Dec. 22.*

Opening of the Birmingham and Gloucester.—The Birmingham and Gloucester Railway was opened throughout its entire length on Thursday week. The *Cheltenham Looker-on* says the traffic along the line has very greatly increased since the extension from Cheltenham to Gloucester, and a similar result may be very reasonably calculated upon from the part now opened at the other end of the line. "We believe (says our contemporary) the average of passengers to and fro between the places last mentioned, has been about two thousand per week; and since the opening there cannot, therefore, have been fewer than ten thousand persons, who have availed themselves of this means of conveyance. The various works at the Lansdowne station are progressing steadily, and the general arrangements of the directors evidence a fixed determination to promote the accommodation and convenience of the public by every means in their power."

Bristol and Exeter Railway.—On Saturday week, the main arch of the Exeter Bridge, 120 feet span, over the river Avon, was keyed in; on which occasion the ceremony of setting the key-stones was performed by Mr. W. Neale, assistant engineer. This bridge for magnitude and simple elegance cannot be surpassed by any in the west of England.

Conviction for Neglect of Duty.—On Wednesday Mr. George Hall, chief superintendent on the Manchester and Leeds Railway, laid an information against John Crossley, a servant in the employ of the company, for neglect of duty. Mr. Hall stated that the charge against the prisoner was that of having omitted to place the "shunts" properly for the arrival at Manchester of the 3 o'clock train on Tuesday afternoon, which neglect involved great danger to the passengers. The information was laid under the 13th clause of the act. From the evidence of one of the guards of the company, it appeared that no inconvenience had been felt, with the exception of considerable shaking of the carriages. Mr. Maude inquired how it was that the train did not go off the line, and was informed by Mr. James Scott, the maker of the shunts, that the latter were so constructed that trains moving at the rate of 25 miles an hour might pass over them when placed wrong, without being thrown off. A witness said the train was going at the rate of four or five miles an hour at the time. The prisoner admitted that they were placed wrong, but said he placed them right before the train came, and that they must have been altered. He also stated that he had 13 pairs to attend to, and that the distance between them was such as to prevent him having them all in view a one time. The Bench fined the defendant 40s., or in default to be committed for one month.—*Manchester Advertiser.*

Edinburgh and Newcastle Railway.—We learn on the best authority that Sir F. Smith has at length reported in favor of the east line of railway to Edinburgh from England.—*Caledonian Mercury.*

RAILWAY ACCIDENTS.

Fatal Accident on the Preston and Lancaster Railway.—On Wednesday week a fearful collision took place on the Lancaster and Preston Railway, between Dock-street and the Maudland (Preston and Wyre) station, about one hundred yards from the crossing to the latter place. It appears that during the afternoon an old man, about 62 years of age, named Henry Taylor, a laborer on the railway, had been carting some ballast near the Maudland station towards Preston, and, having finished his day's work about half-past four o'clock, was returning towards the Maudland with his empty wagons. After he had emptied his last load he was requested by several of the officers to go off the line, as the Fleetwood train was momentarily expected. He, however, refused to comply with this advice, and said he should be able to get off before the train came up. He was warned by several persons as to the danger of returning on the rails, but he seemed to pay no attention, and said, "he had no doubt he could get off the line before the train came up." The unfortunate man was, however, in a few minutes destined to pay dear for his temerity. The train left the Maudland station a few minutes before five o'clock, and had come about a hundred yards on the Lancashire line, when the engine suddenly came in contact with the wagons driven by Taylor. Fortunately the train was proceeding very slowly at the time—not above six miles an hour, otherwise the consequences must have been dreadful. As soon as the collision took place, the engineer stopped the engine instantly, when it was ascertained that so far as the engine, carriages, and passengers were concerned, no damage of consequence and no personal injury were sustained. On walking round the carriages the guard found Henry Taylor lying on the railway. He was perfectly dead. His body was completely cut in two, his head being laid in one direction and his feet in another. An inquest was held on the body on Thursday. The jury returned a verdict of "Accidental death," and expressed an opinion that not the slightest blame could be imputed to the servants of the company.

THE BRIGHTON RAILWAY COMPANY AND THE CROYDON BOARD OF SURVEYORS.

In the Vice-Chancellor's Court on Wednesday a motion was made to dissolve an injunction which had been obtained in November last, restraining the board of surveyors for the parish of Croydon from hindering the London and Brighton Railway Company in crossing a temporary road with their carts and wagons. The temporary road was made for the use of the public while the company were making a permanent diversion of the ancient road. The company had completed the diverted road, and as the temporary road was no longer, in their opinion, required by the public, they obstructed it so as to convey their carts and wagons across it. The surveyors disapproved of the line of the diverted road, and insisted upon keeping open the temporary road until they should be satisfied as to the former. The company's Act contained a special clause that all roads, whether permanent or temporary, and all bridges to be made by the company in the parish of Croydon, should be to the entire satisfaction of the board of surveyors of the parish, and the company were to keep all such roads in repair for a year; and if any road was not properly completed and kept in repair the board might cause such repairs to be done at the expense of the company. The dispute between the parties related to that part of the road leading from Selhurst to Croydon, where it is crossed by the Addiscombe-road. The board had, it appeared, at one time allowed the company to cross the temporary road, but they insisted they had not given permission for locomotive engines to cross it, and, as they were dissatisfied with the diverted road which the company had made, they insisted they had a right to keep the temporary road open for the public use.

In support of the injunction it was insisted that the board, who were not the guardians of the public, were arbitrarily exercising their powers for the purpose of forcing the company to submit to unreasonable terms.

The Vice-Chancellor, after commenting upon the construction of the sections in question, observed that the largest construction in favor of the board amounted to no more than this, that they had power to determine how the diverted road should be made, which would only give them a power to apply to the proper court, if the company were not proceeding to their satisfaction. But, instead of doing so, they had taken the law into their own hands, and erected fences across the railway. They were not in the court in the character of plaintiffs or relators, but as private persons who had a private right to regulate what the company might do; and, then, because the company had done what was displeasing to them, they thought proper to obstruct the works of the company in a manner not warranted by law. They could not be heard in behalf of the public. They were not the guardians of the public safety. The only thing he could do with the motion was to refuse it with costs.

RAILWAYS IN GERMANY.

Emperor Ferdinand's Northern Road,—from Vienna to Bochnia, in Galicia.

The project for this railway, which is the most extensive as yet undertaken in Europe, was conceived already in 1830; from that time up to the year 1836 various local investigations, as well as an examination of the railways executed in England and Belgium, had been made by the banking house of Baron Rothschild, in Vienna, to whom, on application, the imperial privilege was finally granted on the 4th of March, 1836, authorising the formation of a company of shareholders for the construction of a railway from Vienna, the capital of the Austrian empire, to Bochnia, in Galicia, with branches to Brunn, Olmutz, Troppau, Dwory, and Wieliczka. The provisions of this charter are of the most liberal nature; in regard to the right of way the same laws are to be observed as in the establishment of public turnpike roads by Government; no restrictions are made as to the tariff, and during fifty years no rival railway can be constructed between the above designated points. After fifty years the privilege expires, but may be renewed, the road and appurtenances remaining to the company for ever.

Immediately after an arrangement was entered into between the house of Rothschild and a provisory committee, formed by the first subscribers to the stock, subscriptions were received for 6,000 shares (at £100), which, with the 8,000 retained by the owner of the privilege, for himself and his friends, formed a capital stock of £1,400,000 (fourteen millions of florins). This amount was deemed sufficient for the accomplishment of the work. The instalments were made at £10 every half-year, the first on the 30th of April, 1836, the last on the 15th of October, 1840. From the time of the first payment, made by the stockholders, they received an interest at the rate of 4 per cent. per annum.

The charter provided that five miles of the railway were to be completed within two years, and the whole line to Bochnia within ten years from the day the privilege was granted. Accordingly, with the necessary means on hand, operations were immediately commenced, by making the surveys and plans for the section from Vienna to Brunn; the ground was first broken on the 7th of April, 1837, and the works prosecuted with the utmost vigor, from 10,000 to 12,000 laborers having been constantly employed on the line. Already, in November of the same year, the first trips were made to Wagram, a distance of seven miles; in August, 1838, 19 miles of the railway were put into operation, and the whole line to Brunn, of 91 miles in length, was opened on the 7th of July, 1839, or in two years and three months after the commencement of the work. At the same time the works in the main line towards Galicia were steadily progressing, and on the 1st of November, 1840, the following sections were nearly completed:—

	Miles.
From Vienna to Lundenburgh and Brunn (opened)	91
— Lundenburgh to Hradish (main line)	30
— Near Vienna to Stockerau (a branch)	14
Length of railway completed, or nearly so,	135
The following sections are in progress of construction:—	
From Hradish to Prerau (main line)	30
Branch to Olmutz	15
Total completed and in progress	180

At the same time the surveys are now making for the other parts of the main line, and those branches yet to be constructed. The total length of the railway, with all its branches, will not fall far short of 400 miles, which is certainly the greatest extent of any work of this kind yet undertaken in Europe by a single company. The total amount already expended exceeds 10 millions of florins, or one million sterling.

The railway derives its name from its traversing the northern provinces of the empire; amongst its principal objects is the transportation of oxen from Galicia to the Residence, the number of which, according to official data, amount annually to more than 90,000. It will, in every case, contribute largely to develope the resources of those provinces, and become the more important by the connection with the Warsaw and Vienna Railway, now in progress. An uninterrupted line of railway will then exist between the Vistula and the Danube, connecting the Baltic with the Black Sea.

In the following a more detailed account is given of the construction, management, and operations of that part of the Emperor Ferdinand's Northern Railway, which has been for some time in use, viz. of the line from Vienna to Brunn, the capital of Moravia.

The railway commences at the Prater, a little distant rather from the centre, but still within the barriers of the city and suburbs. There is a spacious station, with extensive buildings for the passenger and freight departments, and for the repairing of engines and cars, destined to accommodate not only the line to Brunn, but of the whole railway. After leaving the depôt, the railway crosses two arms of the Danube, by wooden bridges, which are both 1,960 feet in length. These bridges are built very light, in order not to put a permanent obstacle against the floating ice during the spring freshets, the accumulation of which might otherwise cause an inundation of the adjoining country. Having crossed the valley of the Danube, the line pursues a north-eastern course, and reaches the river March, which forms the boundary between Lower Austria and Hungary. After following, for a considerable distance, the course of this river, it crosses the Thaya at Lundenburg by numerous bridges. There, at a point fifty miles from the city of Vienna, the branch road to Brunn parts from the main line, and follows the course of the Thaya and Shwarza until it reaches that capital, while the main line pursues its course in the valley of the March. The railway, although not very direct in its course, has, notwithstanding, several straight lines of considerable length, and the curves are all of very large radii. The whole distance from Vienna to Brunn is, as already mentioned, 91 miles.

The railway rises gradually towards the north with moderate grades. The steepest inclination is nineteen feet per mile, and occurs only once for a short distance. The first 19 miles of railway are graded for a double track, in order to accommodate a branch, which is to lead to Presburg, in Hungary; the remainder will only have a single track. The excavations and embankments are in some parts very considerable; the greatest height of the latter is 38 feet. At Brunn the railway terminates upon a long viaduct over the valley of the Shwarzawa, consisting of 80 arches, 7 of which have a span of 31 feet, the others of 25 feet. The total length is 2,383 feet. Of the works executed the following will give the best idea:—Excavations and embankments, 6,012,500 cubic yards, of which 140,000 cubic yards were excavation in solid rock. Length of wooden bridges, 3,708 feet; length of wooden bridges with stone abutments and piers, 488 feet; number of stone bridges and viaducts, 24, with 228 arches; number of culverts, 116; of road crossings, 198, of which 31 are under, 6 over, and the remainder level with the railway.

The superstructure is made as follows:—Cross ties of wood, formed of half trees of oak, larch or fir, 7¾ feet in length, and 12 inches in diameter, are laid 3 feet 6 inches from each other, upon a layer of gravel, 12 inches thick. Iron rails of 40 lbs. per yard, of the common T pattern, rest in chairs upon every sleeper, and are kept fast by iron keys or wedges. The chairs used at the joints of the rails weigh 14 lbs., the others 10 lbs. The width of the track is 4 feet 8½ inches. The rails were partly imported from England, and partly manufactured in Austria, but owing to the high freight and duty upon the imported rails, and to the inexperience in the manufacture of this article at home, the cost per ton of rails delivered to the road was in both cases not less than from £27 to £27 5s. The price of the chairs was £9 per ton.

Besides the principal station at Vienna, which was mentioned above, there is a similar large one at Brunn, and smaller buildings are on nine intermediate stopping-places on the road, containing also cisterns, in which the water is heated before it is filled into the tenders. There are besides along the line of the railway 80 small houses, for as many watchmen.

For carrying on the transportation business the company own now 22 locomotive engines, of which 17 were built in England, 2 in Belgium, 2 in America, and 1 in Vienna. Of the engines constructed in England, 12 are from Messrs. Robert Stephenson and Co., 2 from Jones and Co., 2 from Turner, Evans, and Co., and 1 from G. and J. Rennie. All the English engines have six wheels, the driving wheels, as usual, in the middle. The two American locomotives were manufactured by William Norris, of Philadelphia; they are much smaller than the English, have also six wheels, but the driving wheels are behind, and the fore wheels supporting a truck, moveable round a centre. These latter wheels are only 30 inches in diameter. Another engine is to arrive in a short time from Philadelphia, from the known manufactory of Messrs. Baldwin, Vail, and Huftey, which has furnished, since 1832, over 150 engines for the American railroads, and two more engines are expected from Messrs. Sharp, Roberts, and Co., of Manchester.

The passenger carriages used upon the railway are of three different classes, and built, like in England, all upon four wheels. The same is the case with the freight wagons: both carriages and wagons are built in the company's own shops.

The following was the expenditure for the Railway from Vienna to Brunn, up to the 1st November, 1839:—

	£	s.
For preliminary surveys, &c.	2,655	18
Right of way	48,721	14
Grading and Bridges	136,070	18
Superstructure: labor	38,603	0
" timber	26,555	8
" iron	167,274	5
Turn-outs and turn-tables	3,917	16
Station buildings, workshops, watch-houses, furniture, utensils, and tools	22,297	12
Engines and carriages, &c.	40,510	9
Cost of administration	3,096	14
Interest paid to stockholders	15,626	8
Total	505,330	2

Since the 1st of November, 1839, there have been expended about £32,000 more, making the total cost of the railway, with buildings, locomotives, carriages, &c. equal to £537,000. This is for 72 miles of single and 19 miles of double track. This sum divided by 91 gives the average cost per mile of railway, with all appurtenances, £5,900, including also the interest on the capital of construction up to the time the line has been opened.

The Vienna and Brunn Railway is used for the transportation of both passengers and freight. The former are conveyed in three different classes of carriages, and pay for the whole distance, in

Carriages of 1st class..	12s. or 1.582d. per mile.
" 2d class..	8s. or 1.005d. "
" 3d class..	6s. or 0.791d. "

Each passenger is allowed 40lbs. of baggage; if the weight is greater he has to pay at the rate of 0.42d. per cwt. per mile. Passengers may procure receipts for their baggage by paying 2d., and can, in such case, deliver the latter the day previous to their departure. If the baggage be lost on the road they can recover the amount of £2 10s. for a trunk, £1 10s. for a valise, and 10s. for a parcel; but may, if they choose, also insure the whole value of the baggage; the rate of insurance being 1-10th per cent.

In summer two trains are daily starting from

each end of the line, one early in the morning and one in the afternoon; in winter one train from each end is sufficient. The passenger trains travel at the rate of 20 to 23 miles per hour, and perform the whole distance in 5 to 5½ hours, including stoppages at nine intermediate stations.

Freight is carried in extra trains, with an average speed of 14 miles per hour. Passengers going with the freight trains pay 2-3ds of the usual fare. The charges for freight are different, according to the specific weight and value of the articles: in the tariff all articles are divided into four classes, and the charges are, for articles of the first class, 1.9d.; of the second, 2.3d.; of the third, 3.1d., and of the fourth, 3.9d. per ton per mile: the average charge for freight is, therefore, 2.8d. per ton per mile. Parties preferring to load a whole wagon pay from 2s. 6d. to 3s., the load in such case not to exceed 3½ tons. The company guarantee only for such goods as have been insured by the proprietors; the rate of insurance is fixed at 1-20 per cent.

The income on the road has been constantly on the increase since it was put into operation.

The revenue in the six months, from 1st May to 1st November, 1839, amounted to £23,013 7s.; in the corresponding half year of 1840, the revenue was:—

From 111,354 passengers	£26,163 18s.
" 18,616 tons of goods	11,466 12
Total.....	£37,630 10

this gross income is at the rate of 14 per cent. per annum, on the capital of construction of £537,000.

The directors have not published yet their report for the year 1840, from which the expenditure for managing the road could be ascertained for this last year. The expenditure for six months viz. from 1st May to 1st November, 1839, was £13,659 3s.

The expenditure amounted, therefore, to near 60 per cent. of the gross receipts, and the net profit was 1¾ per cent. of the capital invested, in the six months above mentioned. In the year ending 31st of October, 1840, the net revenue has amounted, probably, to at least 6 per cent. on the capital expended.

The reason of the great expenditure is, principally, the high price of coke and coal, which makes the item of fuel amount to over 40 per cent. of the total expenses. The coal, of which the company make their coke, has to be brought from a very great distance, and a ton of coke has cost them hitherto not less than £2 14s. The use of wood has been tried, but abandoned again, on account of the sparks.—*Railway Magazine.*

LITERARY NOTICES.

The Law and Practice of Letters Patent for Inventions. By Thomas Webster, Esq. London: Published by Crofts and Blenkarn.

A work of great interest to inventors and patentees has this week been published, which comprises, within a small compass, a digest of the patent laws — including statutes, practical forms, and reports of cases. We have not this week had time to do more than glance over its pages, which appear, however, even on a hasty perusal, to contain a vast store of legal research, and to enter practically into the subject, so that inventors may be enabled to ascertain what are their rights, and the best methods of preserving and defending them. It is an exposition of the law as it *is;* not as it ought to be: therefore Mr. Webster confines himself to the matter in hand. We wish he had travelled a little beyond the record, to point out the iniquities of the present system. We select the following extract relative to the origin of monopolies, and to the justice and principle on which patent rights are founded:—

"Letters patent for inventions derive their origin from the great system of monopolies, which included the mechanical arts, and nearly every branch of trade, down to the commencement of the seventeenth century; and which, however advantageous in the infancy of manufactures and commerce, soon became an intolerable grievance.

"The term monopoly has received a somewhat different interpretation, according to the circumstances under which it is used. The natural meaning of the term is exclusive sale, and as this existed in general by virtue of the grant of some sovereign powers, the term became extended to include the privilege of exclusive sale, and thence other privileges, as of the sole making, working, and using, to which exclusive sale is incidental.

"A monopoly may be created either by an act of the subject, as a contract between party and party, with the view of mutual aggrandizement, or by a grant from the Crown. To the former, the term ingrossing was generally applied. The character of the monopoly, and the consequent legality or illegality, depends on its tendency and effect with reference to the public; and an ultimate test by which the character may be ascertained is, whether the monopolist benefits himself without injuring others. For the whole aim of grants of this nature being to benefit the trade and manufactures of the country, and being dictated by motives of public policy, anything in contravention of these objects would be clearly and entirely against their principle. Monopolies of both kinds, that is, by the act of the party, and by the grant of the Sovereign, have existed at all times and in all countries; and at their commencement have been almost invariably of the same character, namely, contrivances by the party, or agreements between the reigning power and the party, to deprive the people of their natural rights, and to furnish to each other the proceeds of their own avarice. The objects of these grants were confined, in the first instance, to the necessaries of life; but as society advanced in civilisation, and the ingenuity of man was directed to increase the comforts and convenience of life by the extension of commerce and trade, more legitimate objects presented themselves. Thus the subject-matter of a monopoly is twofold—namely, a trade already in existence, and a new invention. By a monopoly of the former kind, all others but the monopolist are excluded from that which the public were already in the possession and practice of, which is a clear violation of public right and policy; but by a monopoly of the latter kind, nothing is taken from the public which it before possessed, and such monopolies, under proper restrictions, may be greatly conducive both to public and private good.

"From the foregoing and following considerations some insight may be obtained into the policy of patent rights. That the person who brings into the public stock some new trade, whence arise the sources of national wealth, should receive some reward for his ingenuity, and some remuneration for the trouble and expense which he has incurred, is only reasonable. Hence the conferring of patent rights may be considered as having the following objects: To reward the inventor for his ingenuity, and for the benefit which he has conferred on the public: to secure to the inventor suitable remuneration for his outlay of capital: and to encourage and stimulate invention and improvements. Hence the granting of letters patent is not a mere matter of favour, but an equitable claim upon the Sovereign. Such being the policy and principles of patent rights, it would appear that a temporary or limited monopoly is a most appropriate, equitable, and convenient reward. For a reward of this nature proceeds directly from the invention; it depends in amount on the utility of the invention, and it is unfettered by legislative interference. The monopoly should only be temporary; for the inventor has no natural or inherent right in his invention; and it would be unjust and injurious to exclude the public, for any great length of time, from a participation in a branch of useful trade newly opened to them. This system of reward has consequently been adopted by most civilised nations, but not to the exclusion of other rewards, under special circumstances, and has been proved to give effectual encouragement to improve the practical arts. The advantageous operation of grants of letters patent on national industry and wealth is widely extended; it generally exhibits itself in some one of the three following objects, viz., the making, using, or vending, to the comparative exclusion of the other two. In inventions like the steam-engine, the using is the great source of value to the public; in others of an inferior nature, either the making or the vending will predominate, and be the great source of value, from the stimulus given to new branches of trade.

"The legitimate subjects for grants of letters patent becoming more distinctly recognised, the powers of the law were resorted to for the repeal of illegal grants, and the punishment of those who had solicited and obtained them. And many grants to corporations, as well as individuals, for privileges of exclusive trade, whereby others were debarred from and hindered in the enjoyment of their natural rights, were declared void, both by common law, and the statutes made for the freedom of trade.

"The prerogative of the Crown, as to granting letters patent, is stated in the following manner in a very early and celebrated case.

"'Where any man by his own charge or industry, or by his own wit and invention, brings a new trade into the realm, or any engine tending to the furtherance of a trade that never was used before, and that for the good of the realm; in such cases the King may grant to him a monopoly patent for some reasonable time, until the subjects may learn the same, in consideration of the good that he doth bring by his invention to the commonwealth, otherwise not.' One part of the consideration of the grant is the instruction of others in the art; the monopoly is to be for a reasonable time, until others may learn the art. What was then thought a reasonable time is not stated, but Sir E. Coke objects to fourteen years as too long, on the grounds that those who have been apprenticed to learn the trade must continue apprenticed until the end of the term, and that consequently a sufficient number of persons would not devote themselves to the manufacture, to supply the wants of the public at the end of the term. This objection shows that the publication of a particular description of the invention, and in what manner it was to be performed, did not then form part of the principles of legislation, but that the invention became as it were a legalised secret during the term of the letters patent.

"It does not appear at what time the principle so strongly insisted on in the present day, viz., that the public should be instructed by the inventor himself, and that the full and public disclosure of the whole secret by the patentee should be a condition of validity of the grant, and the price which he pays for the limited monopoly, began to be distinctly recognised as a fundamental principle of the grant of letters patent. But such a principle is most equitable; for the law granting a monopoly and securing privileges, for the violation of which a party may be punished, it is but just that the invention should be described so accurately that a person who takes proper pains may ascertain what the invention really is, from the exercise of which he is for a time excluded.

"Since the latter part of the reign of Queen Anne, this principle has been fully recognised, and all letters patent since that time have contained a proviso by which they will be void, unless the grantee within a given time, by an instrument under his hand and seal, and enrolled in the High Court of Chancery, particularly describe and ascertain the nature of his invention, and in what manner the same is to be performed. This instrument is called the specification: and so strongly was the House

of Lords impressed with the justice of this condition, that a clause dispensing with the proviso in a bill for prolonging the term of letters patent, was unanimously rejected. But the publication of the invention in this manner being matter of public policy, special circumstances have occurred under which the legislature has thought it advisable to keep the specification sealed up."

GENERAL COMMISSION AND PATENT AGENCY FOR IRELAND.

WE beg to recommend our AGENT for IRELAND, Mr. RICHARD TELFORD, 109, STEPHEN'S GREEN, DUBLIN, as the most eligible person whom PATENTEES can employ for the sale of their articles in Ireland. He has a most extensive and respectable connection, and his house is well known as a depôt for patent goods, inventions, &c. We have no doubt of his efficiency to promote the interest of those parties who may favor him with their business.

Mr. TELFORD also undertakes every description of Patent Agency business for Ireland.

TO CORRESPONDENTS.

It is with pleasure, as well as pride, we acknowledge the complimentary notice of the "Inventors' Advocate," in the MINING JOURNAL *of last week. We at the same time thank our Contemporary for the previous notices of our Journal, that he has had the liberality to insert; and which we have hitherto omitted to acknowledge.*

The SHEFFIELD IRIS, *the* EDINBURGH POST, *and the* MANCHESTER COURIER *have our thanks, for their very friendly notices of our labors.*

Our Middleborough *Correspondent will receive a communication by post.*

GRATUITOUS COPIES *of our Journal have been forwarded to a number of Individuals interested in some Patent or Invention, of which notice has been taken in our number of today.*

"THE INVENTORS' ADVOCATE" *is published every* SATURDAY MORNING, *at* 7 O'CLOCK; and is regularly issued in MONTHLY PARTS, of which 1 *to* 18 ARE NOW READY.

"THE INVENTORS' ADVOCATE" is also published in Volumes containing the Nos. of every 6 months.

Vols. 1 and 2, handsomely bound, are already published.

TO INVENTORS.

PERSONS WHO WISH TO OBTAIN OR DISPOSE OF PATENTS, *or to bring* NEW INVENTIONS INTO USE, *are requested to apply to the* PATENT OFFICE, BRITISH and FOREIGN, No. 198, STRAND, *opposite St. Clement's Church, where they will meet with great facilities to obtain information and to carry out their views.*

THE GALLERY OF INVENTIONS,

Attached to the Patent Office, is a spacious Saloon, well lighted, in which Plans and Models are exhibited. It affords an excellent medium for bringing New Inventions into public notice.

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Among many VALUABLE INVENTIONS *and* PATENTS *registered at the* PATENT OFFICE, BRITISH and FOREIGN, (198, STRAND), *for the investment of capital, Shares are offered for sale in the following Useful Inventions:—*

A Fire Escape of Novel Construction, which may be used as an Observatory.

A Cheap Lamp for burning Tallow and Grease, without overflow or smell.

Patent Screw Jack, for lifting locomotives and other great weights.

An Improved Balance, applicable to small or great weights.

Important Improvement in Wood Paving.

A New and Improved Method of Burning Coke.

New Methods of Purifying and Treating Oils.

A new System of Clock-making.

Patent Forge Back.

A new Castor for Furniture.

Patent Process for the Manufacture of Soda.

Improved Methods of Building Iron Ships.

The Purification of Gas.

Improvements in Soap-making.

An Umbrella, in imitation of a Malacca Cane.

THE

INVENTORS' ADVOCATE,

AND

JOURNAL OF INDUSTRY.

SATURDAY, DECEMBER 26, 1840.

*** *The Office for the publication of* THE INVENTORS' ADVOCATE, *is removed from Tavistock Street, Covent Garden, to the Patent Office, British and Foreign,* 198, *Strand; opposite St. Clement's Church.*

We have on several occasions expressed disapproval of agitation as a means of advancing any public question, instead of relying on the force of argument and the progress of knowledge. All agitation that bears the character of intimidation, as most of the agitations of public questions have done, and continue to do, deserves to be opposed by every one who wishes to see reason substituted for passion, in the guidance of public affairs. But when the question is altogether distinct from party considerations, and the agitation is strictly confined to bringing the subject prominently into notice, and urging it on the attention of public men, then, indeed, such a means, so employed, is not only justifiable, but it becomes the duty of those who consider the object they advocate would produce national benefit.

Questions connected with the improvement of our manufactures are, for the most part, entirely overlooked by the leading members of Parliament, as their attention is absorbed by party contentions, and by the discussion of matters of little real practical benefit. It is to those neglected questions, which are far more important to the national weal than the matters which occupy most of the time of our legislators, that means should be adopted to give prominence and weight. An association of those who are interested in the improvement of manufactures, and the promotion of scientific discovery, tending to open new fields for the exercise of the mechanical arts, seems to be necessary to bring the subject with its proper force before the public.

It unfortunately happens that those matters which most practically affect the improvement of our manufactures are generally unheeded. It has been too much the practice to trust to unaided individual exertion and skill; and as so much has already been done by the mechanical genius of the people, struggling through all difficulties, it is supposed that they will be sufficient, without further stimulus or help, to keep this country in advance of all rival manufacturing nations. The members of the government are generally so occupied with subjects of political interest, that they have little time, and less inclination, to interfere in any question that is not forced on their notice; taking it for granted, that if any amendment in the law were wanting, any grievance to be redressed, or any remedy to be proposed, their attention would be called to it by the parties interested. The individual members of Parliament see no *éclat* to be gained, no political interest to be strengthened, by taking up such questions on their own motion, even did the necessity of amendment in the present laws and regulations suggest itself; the little chance of success that would attend such efforts, when made without previous movement on the part of the people, would be enough to discourage such an attempt. It, therefore, becomes the imperative duty of those who are interested in the efforts of inventive genius, and are anxious that they should be more encouraged and better protected, to rouse from the lethargy that has hitherto possessed them, and take measures to "agitate" for the best interests of the country.

The machinery for such an agitation exists in all parts of the kingdom. The numerous mechanics' institutes and philosophical societies afford ample and effective means for carrying the project into effect. We most earnestly press on their consideration the propriety of instantly organizing means for the purpose of giving due weight to the very important interests which they represent. Parliament will assemble within a month from the present time; and it is important that arrangements should be made so as to bring the subject effectively forward early in the session, or nothing can be done. It would be of great advantage if those different institutions would combine in one plan of operations, to enforce the same objects, and obtain the support of some influential members in both houses, who would undertake, not only to advocate their interests in debate, but to urge them frequently on the notice of ministers. Such a movement ought, however, to be most especially guarded from any party tincture; for that would destroy all hopes of ultimate success. It would be advisable to appoint a deputation, or recognised agents, to act on behalf of the principal institutes and societies in the kingdom, to be in London, to watch over their interests, and to endeavor to promote the measures on which it should be agreed to concentrate their united efforts. Were such a plan of operations adopted and vigorously and unanimously carried into effect, there can be little doubt it would be successful. The importance, in a national point of view, of encouraging discoveries and inventions, that may improve our manufactures, and enable us to excel foreign competitors, is too great to be longer neglected, if the subject be properly brought before Parliament; and the injustice and expense of the patent laws, which operate as obstructions to invention and improvement, are too flagrant to bear the test of Parliamentary inquiry, if it be conducted free from the cramping, narrow-minded, fee-seeking prejudices of the lawyers.

To obtain such notice of this important object, and to procure such an inquiry, it will be necessary that exertions should be made with vigor and without delay. There is one course that is open to all; that is, to petition. Petitions should emanate not only from the mechanics' institutes and public societies collectively, but petitions from

the individual members should also be forwarded to both Houses of Parliament. These would tend to draw some attention to the neglected and oppressed condition of mechanical skill and inventive genius; but we should much prefer a combined plan of operations, of which petitions should form a part, than to trust to them alone.

NEW INVENTIONS.

ETCHING ON GILDED COPPER PLATES.

We noticed in a former number, a suggestion made in the *Fanal*, Brussels paper, for the application of the new process of gilding copper by galvanic electricity, to the purposes of etching. This has since been carried into successful operation, as appears by the following extract of a letter from Professor de la Rive to M. Dumas, which was read at the meeting of the French Academy of Sciences, on the 14th inst.:—An engraver, M. Hammann, has just made a successful application of my process of gilding to etching. Instead of covering the copper-plate intended for the etching with wax, he covered it with gold; he then traced the outlines of his drawing on the surface of this plate, uncovering the film of gold from every place over which his tracer passed. He then poured on the aquafortis, which adhered to and corroded the copper in every part where it was exposed. I send you a specimen of an engraving executed by this process. This process appears to possess some advantages over the ordinary method —In the first place, the coating of gold being permanent, the plate can be corrected should there be any defects found in the first "biting in" of the plate. In the common process, when the wax is once removed, it becomes very difficult to make any corrections. Further; the lines which can be traced on the coating of gold are much finer and more sharp than it is possible to make them on wax; this is a great advantage. It appears that the gilding with mercury for this purpose, besides its being much more expensive, does not possess the same advantages, and cannot be so easily applied for this purpose.

PAPYROGRAPHY.

A special committee was recently appointed by the Society of Arts and Manufactures at Mulhausen, to report upon a new discovery submitted to the society by M. de Manne; the process he terms papyrography; and the committee, in their report, give the description of it in the words of the inventor, as follows:—"My discovery consists,—1st. In reproducing, indefinitely, by means of an ink of my composition, every thing traced by a pen, whether drawing, writing, or music, &c. My sheet of manuscript paper, supplying the place of a mould, from which I obtain at will proofs, either reversed or in their natural position, in relief or concave, as necessity or inclination may require. 2d. In obtaining from my first sketch, made by a pen on common paper, and without any alteration, zinc or copper plates by means of casting, which is a great improvement on wood engraving; because there may be obtained from one drawing either a stereotype for letter-press printing, or an engraving for a copper-plate. 3d. In enabling even the blind to read writing, and rendering them able to hold correspondence—not only with those who have the use of sight, but among themselves, and this by means of the touch, which is so extremely delicate a sense in those deprived of sight; my ink, which is metallic, having a very decided relief on the paper. This discovery, viewed in reference to its amelioration of human suffering, cannot in my estimation be too much appreciated. 4th. In its being a method of writing by means of which persons may be taught to write, and without a master, the pupils having only to go over the tracings with their pen and ink."

Dr. Penot, the member of the committee who drew up the report presented to the Society at Mulhausen, proceeds to state:—"I will now more explicitly describe what these various processes are, and mention the judgment of the committee respecting them; I shall however consider them in a different order from that of the inventor.

"*Method of learning to Write.*—It consists in making the children trace over, in ink, the characters that have been previously written on the paper. Considered only as a mechanical business, this method of teaching is good and expeditious; it had already produced very satisfactory results in our town, before the communication of M. de Manne. This easy method of teaching children to form their letters is in fact far from being new. If the plan communicated by M. de Manne is not new, there is at least in the method adopted by him in preparing his paper an ingenious discovery, highly worthy the attention of the society. I shall enter afterwards into some further explanation of this subject, contenting myself for the present by observing, that his paper being prepared like a dry stamp, so little expense is requisite for this preparation, that M. de Manne can sell it at nearly the same price as common paper is purchased in retail in a warehouse, from 40 to 60 centimes a quire, according to the quality."—*Moniteur Industriel.*

SIR GEORGE CAYLEY'S AIR ENGINE.

The following description of a new engine to be propelled by heated air, the invention of Sir George Cayley, is given in the Polytechnic Journal:—Both in England and France many unsuccessful attempts have been made to convert air into a motive power; Sir George Cayley has at length succeeded. The public will have an opportunity of judging for themselves of the value of this discovery, so soon as a locomotive carriage, now in progress of manufacture, can be got ready. We should have postponed the hasty description we annex until the engine was publicly at work, were we not desirous of disconnecting the late steam-carriage accident in Sloane-street, with the invention in question, with which it has nothing in the world to do. Air is the motive power of the new engine—steam was the motive power of the carriage which met with the accident. The principle of the new engine is easily explained —the details we reserve for another occasion. Air is compressed by the pump into a receiver, to be used when wanted. Motion is communicated to the wheels by pistons acted upon by the air, which is rarefied by heat in its passage from the receiver to the cylinders, where it acts upon the piston rod much in the same way that steam does. Thus, to communicate motion to a piston, a portion of the air in the receiver is forced by compression into tubes subjected to heat, and from thence, in its rarefied state, it rushes to the cylinders as the only place of escape. Motion is accordingly produced. An experimental engine, upon this plan, was exhibited last year to Messrs. Babbage, Rennie, Gordon, Bramah, Renton, and others. It worked with great steadiness at rather above a five-horse power. The power, which was under perfect control, was capable of immediate increase or decrease, the expense of fuel following exactly the same ratio as the power, which is one of the peculiarities of this engine. If it were stopped for a minute, or any number of minutes, or for half an hour, no loss of fuel took place; that is to say, no loss takes place while the engine stands idle. No water is required—a serious consideration; and the consumption of coke is only from four to five pounds weight per horse power per mile. This experimental engine, though perfect as to power, was found inconvenient, in consequence of some of the dust from the coke getting into the working cylinders, which caused them to require more lubrication than was convenient for practical purposes. The engine now building is constructed upon a plan to do away with this evil, which appears to be the only remaining impediment to be overcome. The air-engine, by obviating the necessity of carrying water, and by obtaining the full power from combustion in the most economical manner, bids fair to be applicable on many occasions where the steam-engine is inconvenient, and to vie with it in power.

NIGHT-SIGNAL FOR RAILWAYS.

The manager of the Eastern Counties Railway, R. Hall, Esq., has invented an ingenious system of night signals. On the back part of the chimney of the engine is placed a reflector so inclined that a light pressing from the top of the train will be reflected down upon him. The two guards sent with every train are provided, besides their common lights, with two signals consisting of blue and red lights. Upon the removal of a piece of tin, a screw presses upon some fulminating powder, which immediately ignites the signal and gives out a most intense light for some time, which falling on the engine reflector, is sent down concentrated upon the engine-man, so that he is immediately aware of the signal. The blue light indicates caution, and the red light danger. The light is so exceedingly intense as to give a brilliant illumination all round, and the men who have tried it declare if they were asleep it would wake them. The present signals throw off several luminous balls in succession, but Mr. Hall will in future use the light only. At the junction of the Northern and Eastern, and other parts of the line, the men are provided with these signals. A sliding reflector is added to give greater power to the light, but from what we have seen, we are of opinion that that is unnecessary, as the lights are so strong that they may, in our opinion, be seen for ten or fifteen miles off.—*Railway Times.*

SELF ACTING RAILWAY SIGNALS.

Mr. Rotch, the foreman of the coroner's jury at the recent inquest at Harrow, in a letter to the *Railway Times*, proposes the following expedient, by way of giving a signal of danger to the engine-drivers, which would warn them most effectually whatever was the state of the weather. Its principal defect is, that it would only apply to cases of danger previously known, and would afford no protection against sudden obstructions on the road; —I propose to have the distance posts (which on all railways I have observed occur every quarter of a mile) gauged to a fixed distance from the rail; and on to this post I propose to drive two staples one above the other; into these staples, thus forming a socket, I set a small gibbet at the place it is required to give warning to the driver to stop. The upper horizontal arm of this gibbet projects over the rails, on a level with the handle of the whistle, which should be placed a little to one side of the dome of the boiler for that purpose, and as the engine passes that place, the gibbet striking against the handle opens the whistle, and having performed this operation is instantly struck out of the way of the following carriages by a short fixed stay or rod screwed or riveted on to the dome, just behind the whistle handle, but a little to one side of it. One of those gibbets which fold up and are therefore quite portable, should be taken by each guard, and one kept at each station-house, and at whatever part of the line it is required that the engineer should have warning to stop, it is only to take the gibbet to the quarter mile-post next beyond that spot and stick it in its socket, when the engine will be warned in a manner that must be heard and cannot be mistaken. Again, if the hinder part of a luggage train break off in the night (a very common occurrence) the guard is exposed to having the part of the train he is left with (for he sits always in the last carriage) run into by the next coming train; but if he at once takes his gibbet and goes back to the next quarter mile-post, and sticks it up, the warning to the next train he is in danger from will be inevitable, and no collision need take place.

CAPTAIN SMITH'S PADDLE-BOX SAFETY BOATS.

(From the Hampshire Telegraph.)

The following extract of a letter from the Captain of the Steamer *Peru*, dated off Rio Janeiro, 13th August, 1840 (out 29 days from Plymouth), bears high testimony to the merits of this excellent invention :—

My dear Sir,

I embrace an opportunity of informing you how much pleased I am with your Paddle-box Safety Boats. I have had no occasion to unship anything, and in taking off and putting on the paddle-boards, as required for sailing or steaming, we had only to lift the boat's gun-whale a few inches; this enabled us to perform the operation in a short space of time: for we could get at all the boards to be taken off at once, instead of the tedious and difficult practice of turning the wheel board by board to bring them through the scuttle cut for that purpose. When we became light and a little crank, I turned the weather boat over with great advantage, on a wind, and this gave me an opportunity of painting them alternately, and blacking the davits, oiling the joints, &c., and we found no difficulty in so doing.

I think you might dispense with the scuttles; I never found it requisite to open them, although we have had *some heavy rolling*; the trunks (in the boat's bottom, for carrying out an anchor, &c.), allowed the air to escape, and the gratings at the sides of the paddle-box, the water.

No steamer ought to be without *these admirable boats*, and they may be made much cheaper and lighter than ours and the Chili's,—the mast and sail answer admirably.

Wishing you success in all your scientific and praiseworthy exertions, believe me to be,

My dear Sir, your's, very truly,

George Peacock.

TRIALS OF AMERICAN LOCOMOTIVE ENGINES.

The following account of trials made of three locomotive engines, manufactured by Mr. Norris, of Philadelphia, was given by Captain Moorsom, R. E., at a meeting of the Institution of Civil Engineers, and reported in their proceedings, with a short statement of the opinions expressed on the subject by the engineers who were present when the report was read :—

The engines of which the author more especially treats were sent to England, under an agreement to supply "locomotive engines of higher power, greater durability, and less weight," than could be obtained in this country. They were to be subjected to fifteen trials within thirty days, and prove their capability of drawing, "up a gradient of 1 in 330, a load of 100 tons, gross weight, at the speed of 20 miles per hour; and up a gradient of 1 in 180, a load of 100 tons, gross weight, at the speed of 14 miles per hour." The pressure of the steam in the boiler was stipulated by the Grand Junction Company (on whose railway the trials were made) not to exceed 60 lbs. per square inch.

The construction of these engines is very simple, and the work plain. The boiler is horizontal, and contains 78 copper tubes, 2 inches diameter and 8 feet long each, with an iron fire-box. The cylinders, 10½ inches diameter, are slightly inclined downwards, and so placed that the piston rods work outside the wheels, thus avoiding the necessity of cranked axles. The frame is supported by 6 wheels; the two driving wheels, of 4 feet diameter, are placed close before the fire-box; the other four wheels, of 30 inches diameter, are attached to a truck, which carries the front end of the boiler, and is connected with the frame by a centre-pin, on which it turns freely, allowing the truck to accommodate itself to the exterior rail of the curve, and with the assistance of the cone of the wheels to pass round with very little stress upon the rails.

	Tons.	cwts.
The weight of the engine, with the boiler and fire-box full, was	9	11¼
That of the tender, with 21 cwts. of coke and 520 gallons of water, was . . .	6	4¼
Total weight	15	15½

The engines, when empty, weighed . . . 8 tons.

The trials were made on the Grand Junction Railway, in April and May, 1839, and were continued over the whole distance from Birmingham to Liverpool, except when stopping short at Warrington to take loads; and occasionally making double trips, so as to travel the total distance of 156 miles per day. Attention was more particularly paid to the speed when ascending the gradients, which rise at the rate of 1 in 330 (16 feet in a mile) or 1 in 177 (29 feet 4 inches per mile), and as the engine approached these gradients frequently either at an accelerated or a diminished speed, the observations were made at the points most remote from the cause of variation from uniform velocity. Some of the trials were made with such a number of empty wagons to make up the weight, that the train attained a length of nearly an eighth of a mile; this required some allowance, which was estimated from one-eighth to one-ninth in addition to the actual weight of the empty wagons.

The extreme limit of working pressure of the steam in the boiler was 62 lbs. per square inch, except for a few minutes on one occasion, when it rose to 64 lbs. The usual pressure for the locomotive engine boilers on railways now generally at work is from 50 to 75 lbs. per square inch.

An analysis of the tabulated results of the several trips gives these general results:—That on a plane of 1 in 330, with a load varying from 100 to 120 tons, the speed varied from 13 8-10th miles to 22½ miles per hour; that on a plane of 1 in 177, with a load of 100 tons, the speed varied from 9 8-10th miles to 13 8-10th miles per hour.

From the analysis it appears, that allowing in five of the trials the stipulated amount of performance to have been made, and that in five other trials a doubt may exist, still in the remaining eleven trials the exact amount of duty demanded was not performed.

A comparison of the journeys up from Liverpool to Birmingham, with those down from Birmingham to Liverpool, gives rather a singular result. The aggregate rise of the gradients from Liverpool to Birmingham is about 620 feet, that from Birmingham to Liverpool is about 380 feet (exclusive in both cases of the Liverpool and Manchester Railway); the difference, therefore, up to Birmingham is about 240 feet. In 7 journeys of 596 miles up to Birmingham, the engine conveyed 682 tons gross, evaporated 12,705 gallons of water, and consumed 177 sacks of coal (1½ cwt. each). In 7 journeys of 596 miles down from Birmingham, the same engine conveyed 629 tons gross, evaporated 12,379 gallons of water, and consumed 177 sacks of coke. It would thus appear that the consumption of fuel was the same in both cases, and the only difference was the evaporation of 326 gallons of water more in the journey up than in the journey down, conveying nearly the same load both ways.

The author remarks, that in the early stage of his observations on the engine, he would have inferred that, from the mode of construction, it was not calculated for high speeds, such as are required for the mail trains; yet that he has often seen it travel with apparent ease at the speed of thirty miles per hour; and he thinks that, with some slight modification of the working parts, the engines of this construction may be made to do any duty now required from locomotive engines; and, from the small quantity of repair required during the trial (only renewing the fire-bars, which were originally intended for burning wood, and putting nine stronger ferules in the tubes), he is of opinion, that the present construction is exceedingly well calculated for heavy loads—that it might be modified for attaining high speeds, and will prove a durable and economical machine.

Captain Moorsom, in reply to some questions from several members, stated, that although the American locomotive engines had not strictly complied with the stipulated conditions, yet he considered them good, serviceable engines, and it was the intention of the directors of the Birmingham and Gloucester Railway Company to have ten of them on their line. The price of the engine complete, including the import duty of 20 per cent., is from £1,500 to £1,600. One of the greatest advantages of the engines is the facility afforded by the truck for going round curves—the same engineer managing indiscriminately the ordinary six-wheeled engines, and the American ones are observed to go faster round the curves with the latter than with the former. Round a curve of 10 chains radius, they had gone at a speed of twenty miles per hour. They run also quite as well on a straight road. He had travelled on them between Whitmore and Crewe at the speed of from 30 to 40 miles per hour. They appeared less likely to be thrown off the rails than other engines, as in some instances they had run over the short pointers of the Grand Junction Railway—the engineer had merely felt a slight jar, but no accident had occurred. He attributed this to the truck adapting itself so readily to the rails. The coke used in the trials was the same as that in daily use on the Grand Junction Railway, and was of average quality. The mode of attaching the tender to the engine was peculiar, and he considered it to be advantageous, as it threw a portion of the weight upon the engine and was an assistance in starting. The engines, as they are now constructed, will do well for all ordinary speeds: but if higher speeds are required, a greater expense must be incurred, and certain alterations must be made in them.

Mr. Bury conceived the chief peculiarity of the engine to consist in the end of the boiler being placed on the moveable truck, which certainly enabled it to adapt itself easily to any curve in the railway. The cylinders are in the same position as those in the first of Stephenson's engines, and the other parts are as nearly as possible identical with plain engines constructed in England. The pointers on the Grand Junction Railway are constructed and placed in such a manner as not to throw off a carriage which might run over them, and a four-wheeled engine would not have been thrown off by meeting a closed pointer. To enable him to form a correct comparative estimate of the work done by these engines, it should be shown what power was exerted at the wheels. This was a clear mode of arriving at a result and comparison with other engines.

LIABILITY OF FICTITIOUS SHAREHOLDERS IN A PUBLIC COMPANY.

The Vice-Chancellor on Monday gave judgment in the case of Preston *v.* Guyton, which was argued on the 10th inst., upon demurrers to the bill of Mr. D'Arcey Preston, a shareholder in the Grand Collier Dock Company, which sought to make nine persons who subscribed for 1,000 shares each to obtain the passing of the bill through Parliament, and signed a memorandum declaring that these shares were held in trust for the company, and afterwards passed a resolution transferring them into the name of the secretary, still liable to the other shareholders to the amount of their several shares.

The Vice-Chancellor delivered the following judgment on the demurrers. His Honor commenced by observing that the demurrer put in by Samuel Sanderson Hall differed from those of the other defendants, and that relief could not be had against him as a mere director, but might be administered against the seven persons who were parties to the alleged fraud of subscribing their names for 1,000 shares each. His Honor then stated the circumstances which have been already reported. There appeared to have been first a deposit of £1 per share, and afterwards two calls of £5 and £2, which had been paid to the bankers of the company, and the bill sought, among other things,

to restrain the defendants from taking steps to declare or procure a forfeiture of the plaintiff's 20 shares. Though the Act of Parliament declared that if a share had not been paid the directors might declare it forfeited, yet his Honor was of opinion that in a case where before a declaration of forfeiture the whole amount of what was due in respect of a call had been paid, and no offer had been made to repay that amount, the Court would not allow the directors to proceed to declare the share forfeited. For it would be contrary to common equity, plain sense and justice, that parties should receive and keep in their possession the amount of the call, and afterwards proceed to declare it forfeited. Had the case rested only on that, the demurrer must have been overruled, but as the case of Hall was distinguished from the rest, he had to consider the general equity of the case. With regard to the term "fraud," which had been used by the bill, he thought it was hardly in fairness applicable to the transaction. Whether the nine persons mentioned signed the Parliamentary deed or not was not very material, because they were stated on the face of the bill to be subscribers for 1,000 shares each. There was some difficulty in determining, from the way the thing was represented on the bill, whether there ever were the two memorandums of the 4th and 5th July, 1837; but supposing them to have existed, the bill went on to pray, that the two memorandums and certain other acts might be declared to be illegal and fraudulent. His Honor took it as a fact, that for the purpose of enabling the bill to pass the House of Lords nine gentlemen did procure further subscriptions to the amount of 9,530 shares, out of which they each took 1,000 shares. They were the owners of the shares, and if they were trustees for the company they were liable still by the provisions of the act to all those operations which were to be performed, by virtue of the act, by those who held the shares, and though they might, like any other trustees, have a right to be re-imbursed by their *cestuique* trust all the expenses they incurred in the execution of the trusteeship, they were still, in his Honor's opinion, primarily liable. It was impossible to read the Act of Parliament without seeing it was the intention of the legislature that those who became shareholders should all pay rateably. The parties, however, did not seem, in his Honor's opinion, to have managed the matter exactly as they ought. To this day there had been no transfer of their shares by the nine subscribers; the consequence of which was, that, let them state what they pleased with respect to an acknowledgment of the trust and an intention to exonerate themselves from any liability as trustees, they were still, by the provisions of the act, clearly liable, when calls were made by the directors on the other shareholders of the company, to have calls made upon them. His Honor did not think the Court would ever allow the directors of the company so to proceed as partially to call upon some shareholders to pay a deposit and to pay calls, and not upon others. It was plain to his Honor's understanding that no fraud was intended, but that the thing really intended was a benefit to all the subscribers—namely, that they should all obtain the act they wished. That was clearly the object of the proceeding by which these nine gentlemen had become shareholders of the company, and in this respect they had committed an error which the Court would set right. When the directors thought proper to make the calls they did, they certainly stopped short of their duty; for they ought to have gone on to direct the same sums to be paid upon the 9,530 shares, as they did upon the others held by the registered shareholders. It was quite plain, in whatever way it was to be done, the Court would rectify the error, and take care that all the shareholders should be put upon the same footing with respect to their liability to pay calls.

Demurrers overruled.

MINING SCHOOL.—Sir C. Lemon lately made an offer of a large sum of money for building a mining school, with an endowment for its subsequent maintenance, but the mine adventurers of Cornwall, to whom the proposition was made, have declared against accepting his offer. He consequently declines proceeding further in the matter; and so desirable an object is likely, for the present at least, to be abandoned.

ORIGINAL REPORTS OF SCIENTIFIC MEETINGS.

(Contributed expressly to the Inventors' Advocate)

MEETINGS OF THE SCIENTIFIC BODIES OF LONDON,—FOR THE WEEK COMMENCING DECEMBER 28, 1840.

Tuesday.	Architectural Society 8	P.M.
Friday.	Botanical Society 8	P.M.
Saturday	Asiatic Society 2	P.M.
	Mathematical Society 8	P.M.

LINNÆAN SOCIETY.

Dec. 15.—Edward Forster, F.R.S., V.P., in the Chair.

Mr. Hugh Cumings presented the society with a series of his valuable specimens of ferns, collected by him in the Philippine Islands, comprising upwards of 400 species, many of which are undescribed; and one, as the genus *Malonia*, of which but a single specimen was to be found in Great Britain, prior to Mr. Cumings's return. Mr. Heward, of Kensington, presented a collection of plants from New Zealand, collected by Mr. Allan Cunningham. Some beautifully dried Kent plants were exhibited by Mr. W. T. Iliff, preserved by Mrs. Grayling, of Canterbury. A communication was read from Mr. Bentham, Secretary of the Horticultural Society, on two new genera of plants, which he had selected from the collection formed by Mr. R. H. Schomburgh, during his travels in British Guiana. Mr. Harvey had also favored him with specimens of the same from Port Natal, South Africa, in flower and fruit. The following gentlemen were then elected fellows:—the Rev. W. Cuthbert, of Regent's Park, and W. Griffiths, Esq., Assistant Surgeon in the E. I. C.'s service, a gentleman who has done much to promote the various branches of natural history, especially entomology, by forwarding specimens from India to be investigated.

Mr. Powell attended in the Museum, and exhibited many very beautiful objects under his last and most approved microscope, the value of which, on inquiry, was stated to be ninety guineas. The whole instrument is finished in the most masterly manner, and the arrangements of the stand, both as to extent of motion in the stage (which is considerable), and its stability, is not to be surpassed. At the present time science is making such great and important strides, that the philosophical inquirer would sooner be without his books of reference than his instrument of research—the microscope; and we surely find that scientific men are availing themselves of the apparently expensive though complete apparatuses of a Powell, a Ross, or a Smith, to fathom those intricate and vast physiological and structural facts, such perfect optical instruments can alone enable them to judge, examine, and record (in the only true spirit of philosophy) *"with accuracy."*

BOTANICAL SOCIETY OF LONDON.

Dec. 18. J. E. Gray, F.R.S., &c., President, in the Chair.

A continuation of Mr. Daniel Cooper's Paper on "Vegetable Wax," was read and concluded. The genus *Myrica*, which includes the Gales and Dutch myrtles, yields a very large quantity of this wax. From four species Dr. Krauss obtained it, when in South Africa, viz. *M. cordifolia*, *M. quercifolia*, *M. laciniata*, and *M. serrata*. From twenty bushels of the berries thrown into boiling water about 40 pounds weight were obtained on skimming the surface of the water (the melted wax floating), and pressing the berries between cloths. When obtained, it is of a dirty green color, but may be clarified by re-melting. The shrubs which yield the berries afford about seven pounds weight of fruit—from which if the natives procure one pound of wax they are satisfied. It burns with a very white light, produces little or no smoke, and during the combustion emits a pleasant and agreeable odor. When manufactured into candles, a small proportion of tallow is mixed with it; otherwise it is too brittle. Candles made of it have the advantage of not becoming soft in the hot seasons in Africa and South America, where the shrubs abound.

Wax is also obtained in some quantity from a palm, which, according to Humboldt, grows on the mountains of Quindiu (the Andes), at a height of 7,530 to 9,843 feet. It is a tree of great size, mounting to upwards of 160 feet, the base of which is about 6 feet in circumference. When the raspings of the bark are thrown into hot water, the wax separates from the bark, and floats on the surface, (although it does not melt), this being a distinguishing character to that yielded by the Gales (*Myrica*). The natives collect it in some quantity, and form it into balls, which they dry in the sun. It requires a temperature rather greater than boiling water to melt it; and, when burning, gives off a great deal of smoke—in this respect also differing from the former. From analyses made by Boussingault, the composition of this wax and bees wax are as nearly as possible the same. It is with great difficulty these kinds of wax are converted into soap by the action of powerful alkalies.

Of the wax obtained from the milk or fluid of the Cow-tree of South America.—It is to Dr. Thomson of Glasgow, that science is indebted for an account of this substance, and to which he has given the name of *Galactin*. The *Cow-tree* occurs abundantly on the mountains situated at the north-west part of Venezuela, at an elevation of 10,000 feet. The milk or juice is obtained in considerable abundance by simply wounding the tree. It melts at 137 deg. Fahrenheit, and is of the specific grav. 0.969. It may readily be dissolved in oil of turpentine, and hot alcohol and ether.

Lastly, *vegetable wax* has been said to be obtained in China from a species of Privet (*Ligustrum lucidum.*)

The above plants are those only from which wax has been obtained in sufficient quantities for domestic uses. Its physiological important uses were recorded in a former number.

ZOOLOGICAL SOCIETY.

Dec. 22.—W. Yarrell, Esq., V. P., F.L.S., in the Chair.

Mr. H. Cumings exhibited a very fine series of shells from the Philippine Islands, including nine very distinct varieties, *Helixcyclostina Daphnis*; the principal character of each of the varieties being taken from the very delicate colorings and markings observable in the epidermis (outer skin). A letter was read, from Mr. Friendly, of Gibraltar, in which he stated that two specimens of sharks—including the animal and skin of the *blue shark*—had been forwarded to the society. Mr. Yarrell made some observations on the viviparous sharks, possessing no umbilical cord, and stated that they were nourished simply by absorption. In the viviparous *blenny*, the passage from these animals possessed of the umbilical cord to those not possessing it, could be distinctly traced.

A communication was read by W. J. Broderip, Esq., "On some new species of Shells from the Philippine Islands, brought to this country by Hugh Cumings, Esq."—The paper was entirely descriptive. A discussion afterwards ensued as to the probable cause of the occurrence of the very variable and delicate colored epidermis, which appears peculiar to many of the shells of the Philippine Islands, and which may be removed by simply rubbing them with a little water, and in many of the species by handling alone. Several questions were asked of Mr. Cumings as to the nature of the physical characters of the country, and also whether he had observed any atmospheric phenomena which could throw any light on the subject? to which Mr. C. replied, that the subsoil was very variable, and with respect to the atmosphere he had never observed any fogs, or any other striking phenomena. With regard to the character of the foliage there was much diversity of color, and particularly on the

expansion of the buds, when the young leaves on their first opening were red, which gave a singular feature to the surrounding scenery. Some of these beautiful shells occurred in great numbers; on one occasion he had a branch of a palm brought to him by a native, which grew by the river side, in partly salt and fresh water, from which he took 57 specimens; and on his making known that he was desirous of having some snails, in the course of a few hours as many as four or five bushels were brought to him by boys, all, however, of one species.—Mr. C. stated that he had forwarded a number of specimens to Sir D. Brewster, who is investigating the nature of this epidermis. A few remarks were also made by Mr. Cumings on the eggs of snails, some of which are deposited soft on the leaves of trees, which coil up; and others are of a hard nature, at the extremity of which he discerned a little gummy matter which caused the egg to assume one position only and to fix it in safety. In the genus *Carocolla*, some species deposit hard eggs in the ground, and some bring forth their young alive (viviparous).

Mr. Waterhouse then made some verbal observations on three new birds—two of which were allied to the woodpecker. Some curious facts were mentioned connected with the brilliancy of coloring of animals, especially birds and insects, and which seems to depend, in a great measure, on their exposure to the light of the sun. In the majority of animals it is well known that the dark and colored parts are situated on their back, while under the belly it is usually white or some light color. Those insects which run about in sunshine, have mostly bright colors, while those which seek their food, &c., at night, and only come out at that time, are mostly of a brown or dark hue. In our British butterflies and moths, this is evident; the former flying about in the sunshine, have generally vivid colors, while the moths, which fly at night, are generally dark. Two or three species of British moths fly in the sunshine, and they are possessed of a greater brilliancy of color. The Brazilian insects, for the most part, possess much color. The African species, however, are not so brilliant as those from South America. Mr. Cumings stated that he had seen thousands of butterflies in the Philippine Islands as he supposed, feeding off mud (or sucking up the water). The common white butterfly of Britain may be frequently seen in the country sucking up water from the roads, either after rain or after the roads have been watered. Mr. Lay stated that the *Mantis* tribe of insects were fond of drinking, and he had even given them ink. It is also necessary, in breeding caterpillars, that water should be given to them, as they drink a considerable quantity of that fluid; and it is a usual custom with entomologists to wet a clothes'-brush with water and tap the leaves on which the caterpillars are about to feed, to distribute the moisture in a more equal manner over their surface, and thus imitate the deposit of dew. The Chinese are aware of this fact, and always damp the leaves they give to their silkworms. If caterpillars and moths do not have sufficient water, they do not attain their proper size by one-half. The meeting then adjourned until January 12, 1841.

THE EARTH AND THE ATMOSPHERE.

At the Brighton Mechanics' Institution last week, Mr. Browning delivered a lecture on the subject of the earth and its atmosphere. The lecturer proceeded to discuss the properties of matter—its infinite divisibility, its powers of attraction, gravitation, &c., and to show that these powers operated, first, in proportion to their mass, and secondly inversely as the squares of their distance. The natural law that all bodies on the surface of great spherical masses, as the sun, the earth, &c., were attracted, or gravitated to the centre, was next treated of; and the lecturer showed that, according to this law, it would be impossible for organised beings, such as the habitants of this globe, to exist on the surface of the sun, the power of attraction there, being 28 fold that of the earth; he observed, that the earth's rotation on its axis, and the centrifugal force thus generated, render all matter lighter by degrees from the poles towards the equator. This was confirmed by observation, from which it appeared that there is a considerable difference in the downward tendency of the same body when removed successively to different latitudes; and it was proved that the extreme amount of this variation of gravity was about 1 in 195, the rate of increase being as the square of the sine of the latitude. By these means Newton determined the figure of the earth to be an oblate spheroid. After explaining how the forces of attraction and gravitation operate in causing the earth to revolve around the great centre of our system, the lecturer proceeded to consider the expansive powers of subterranean gases, and the perfection of design shown in the fact that the elevations of the earth's crust were always in a line with the greatest extent of country; forming a natural barrier against the encroachments of the sea, and in the torrid zone, where they were the highest, providing, in their snow-clad summits, an immense store of water for the use and sustenance of the surrounding lands when melted.

A brief view of the uses of beds of earth and gravel, as filters and depositaries of pure water, followed; and Mr. Browning then proceeded to the second portion of his lecture—the Atmosphere,—which he defined "as an aerial ocean in which the earth swims, and which gravitates to the centre of the globe, with a force equal to about 15 lbs. to the square inch."—Various well-executed experiments and illustrations proved this, and the lecturer then estimated the height of the earth's atmosphere above the level of the sea, and showed that its mass diminished in geometrical proportion to its elevation; proving, also, by some very successful experiments, its elasticity, and expansion by heat, and contending that its elementary gases were not chemically combined but mechanically mixed. Its wonderful faculty of self-purification, its immutable quality, its essentiality to the support of terrestrial beings,—and the sole exception which it formed to the chemical combination of gases were all remarked upon. The lecturer next proved, by insulating a musical box in the exhausted receiver of an air pump (by which means its power of sound was suspended) that the air was the medium of sound, and adverted to the wonderful but indispensable property of the atmosphere, which conveyed sounds, of whatever pitch, in equal times, and thus caused each successive sound to reach the ear in the order in which it was propagated—(contrary to the effect produced by an impetus given to any other undulating medium). He then proceeded to consider the laws of evaporation and condensation—the nicely-ordered mechanism by which the land is supplied with more water than it parts with by evaporation—and estimated, as regards Great Britain, the quantity annually carried off by rivers. Mr. Browning concluded by briefly recapitulating the beautiful natural combinations which had been brought under the notice of the audience, and enthusiastically referred to the adaptation of all the Creator's works to the happiness of the human race.—*Sussex Advertiser.*

SCIENTIFIC MEMORANDA, AND NOTES ON ART.

Abstraction of Air by Blast-Furnaces.—The abstraction from the atmosphere by the iron blast-furnaces is prodigious, yet, to all seeming, unfelt. The most copious well may be pumped dry—the largest steam generators exhausted; but what air engine has ever yet made any visible impression on the atmosphere? At the Dowlais Iron Works, where about 1,200 tons of pig-iron are made weekly, the prodigious quantity of 30,000 tons of air must be withdrawn weekly from the surrounding atmosphere, and passed literally through the "fiery furnace;" yet the void occasioned by this perpetual drain is constantly restored by means unknown to us, and without the smallest inconvenience to those who live and breathe in the same medium.—*Mechanics' Almanack.*

Improvements in the Manufacture of Iron.—The modern progress of the iron manufacture is by few facts more strikingly exemplified than by this—that formerly it required more than four tons of engine coal for the production of one ton of iron, while, in consequence of the numerous improvements introduced, chiefly within the last thirty years, half a ton only is now the average quantity required; that is to say, above eight times the quantity of iron is obtained from the same engine power.—*Mechanics' Almanack.*

Expedition to British Guiana.—Mr. R. H. Schomburgh, a gentleman whose name and fame as a scientific explorer has meritoriously elicited the praise of not only the Government and scientific men of this country, but those of his native land, sailed on Saturday last from London, on an expedition fitted out by Government, with a view to follow up his researches in that country, with which his name has for some years been so intimately connected, and to fix the boundary line in those dominions. Mr. W. Walton and Mr. T. Hancock have accompanied him as artist and secretary. It is expected that the expedition will occupy between three and four years, and we have no doubt that on Mr. Schomburgh's return, science will benefit much, as heretofore, by the liberality and good feeling, on all occasions evinced to promote the interests of natural history, for which his name stands unrivalled.

The meeting of the Italian Association for the Advancement of Science, founded on the model of the British Association, will be held at Padua next year.'

Improved Safety Lamp.—At a meeting of the Cheltenham Literary and Philosophical Institution, on Tuesday evening, December 8, Mr. J. Murray delivered the last of his course of lectures on Calorie, Combustion, and Flame. In the course of it he introduced an improved safety lamp, which he considered preferable to Davy's. The improvement consisted in surrounding the sides of the lamp with glass, leaving it protected only by the wire at the top.—*Cheltenham Free Press.*

Manna.—Manna was long considered as a substance which fell from the heavens, till incontestable experiments demonstrated it to be an exudation from trees. It has the form of oblong globules or masses, of a yellowish white colour, and some degree of transparency. It is the produce of various trees, but is chiefly procured from the *Fraxinus Ornus*, the flowering ash, which grows abundantly in Sicily and Calabria. It partly exudes spontaneously during the summer months, and is partly obtained by incisions. The juice gradually concretes into a solid mass, or it is dried in the sun or in stoves. The *Fraxinus Rotundifolia* also yields manna, as well as *F. Ornus*. It exudes likewise from the *Pinus Larix*. This exudation is known by the name of manna of Briancon. It is so much mixed with turpentine, that it is very little used. Vogel has shown also that it exists in the leaves of the *Apium Graveolens*, or *Celery*. And Fourcroy and Vauquelin extracted a substance resembling manna in considerable quantity from onions. The manna of the shops is obtained from the *F. Ornus*. But there is a tree in New South Wales, the *Eucalyptus Mannifera*, which, according to Dr. Mudie, yields a manna exactly similar to that of the *F. Ornus*. It is now imported from Botany Bay for medical purposes. To obtain pure manna, it is only necessary to dissolve the manna of the shops in boiling alcohol, and allow the solution to cool. The manna crystallizes.—*Dr. Thomson's Vegetable Chemistry.*

VARIETIES.

Extraordinary Improvement in Naval Gunnery.—A letter from Flushing of the 20th ult. says, "To-day trials have been made by His Majesty's command in our road, by Captain Gobins, of the artillery, of an instrument invented by him, and which possesses the remarkable property of increasing the firing of our men-of-war, in comparison with that of other nations, five or six-fold. We hear that these trials were highly satisfactory."

Buckles Dispensed with.—We noticed a short time ago the invention of a new metal button by Messrs. Rowley and Smeeton of Birmingham, which is fastened without sewing. They have since extended the application of their contrivance so as to dispense with buckles in some instances. Braces have been made to which these buttons are fixed instead of buckles, and answer remarkably well. They are so contrived as to answer the three-fold purposes of allowing the braces to be lengthened at will, of keeping the button-holes firm, and of allowing, to a certain extent, of the action of the pulley, to suit the movements of the body.

The Iron Trade.—Sir John Guest states that all protecting duties are nugatory on iron, as it can be manufactured cheaper in this country than in any other part of the world. He gives the following sketch of the Iron trade:—"In 1740 almost the whole of the iron in this country was made from charcoal, and the make was 17,350 tons. In 1788, in consequence of the introduction of the new process of making iron with pit coal, the quantity increased to 68,300 tons, about which time Mr. Watt brought his improvements to bear upon the iron trade by the introduction of steam engines for blowing the furnaces; after which time there was a still more rapid increase.—In 1796 the quantity produced was 125,000 tons. In the next ten years, down to 1806, the quantity was increased to 258,000 tons. In 1823 the quantity produced was 452,000 tons. The quantity in 1825 was 581,000 tons—this was all pig iron. In 1828 the quantity was 703,000 tons. From that time to 1831 it became stationary; it rather diminished in 1830, in consequence of the distress which prevailed in the country at that time; from which time the increase has been still more rapid. In 1835 it was estimated at about a million of tons: in 1836 it was estimated at 1,200,000 tons; and the estimate made by a very intelligent person who went round the works in 1839, was 1,512,000 tons, which is rather increasing. A very large proportion of the great increase latterly has been produced by the introduction of hot air in the blast of furnaces."—*Report on Import Duties.*

Adventures of a Chronometer.—The chronometer which was in the Bounty at the time of the mutiny has at length been discovered, and given up to Captain Herbert, of her Majesty's ship Calliope. The chronometer, marked "Saremn Kendal, London, A.n. 1771," fell into the hands of a captain of an American, who touche l at Pitcairn's Island, shortly after the mutineers had settled themselves there. It was stolen from the American captain on the ship's passage from Juan Fernandez to Valparaiso; and next made its appearance at Conception, where it was purchased for three doubloons by an old Spaniard of the name of Castillo, who kept it in his possession till his death, which happened lately at Santiago, when his family sent it to Captain Herbert, to be conveyed to the British Museum. It appears, on being taken to be repaired by Mr. Monat, of Valparaiso, that it was in a complete state of preservation, without the least mark of wear in any part of it. The escapement palates are rubies fixed to the verge of the balance by screw collets. Mr. Monat speaks in high terms of the beauty of the workmanship. The chronometer is five inches in diameter, with three dials on its face, one for hours, one for minutes, and one for seconds, with an outer silver case, made as the outer cases of pocket watches were sixty or seventy years ago, so that its appearance is of a gigantic watch. In winding it up it was usual to pass the left arm through the opening for the face in the upper valve of the outer case, in the manner of placing the outer case of a pocket watch on the left thumb when winding. It is now on board the Calliope, and will, in all probability, return to the place of its construction after an absence of so many years.—*Devonport Telegraph.*

Iron Trade of Malaga.—The iron foundry, which is above a mile from the city, is a most profitable and well-conducted establishment, nearly 2,700 tons being wrought there, which finds a ready sale in the Andalusian provinces at good prices—say, about £4,500 for the whole quantity. These works are, however, not so profitable as they might be, from the circumstance, that although the iron ore is very good, and the vein is abundant, fuel is exceedingly scarce. A coal mine, which is situated about ten leagues from the foundry, is not available, on account of the difficulty and expense there would be in making a railroad through the mountains, and the coal which is used is brought from Great Britain and from Gijon in the Asturias.

Coal Mines on Mount Lebanon.—I visited the coal mines on Mount Lebanon which the Pacha is working. The difficulty of access, and consequent cost of transport, must make the undertaking one of very doubtful result. The descent is long and precipitous from the village of Cornail, and the mines appeared in a very unsafe state, for our candles were frequently extinguished, and the oppression of the atmosphere was great. The galleries enter the mountain horizontally. The quantity of coal is considerable, but rather of a sulphurous quality. The number of workmen is 114, who are paid three piasters each, equal to 7½d. per day, and who work in two relays both day and night. The whole of the operations were under the direction of an Englishman (Mr. Bretell); but he has been superseded by a Turk, who appeared to have but little knowledge or experience to fit him for the discharge of his duties. The quantity of coal extracted in 1837 was 14,700 eantars of 217 okes, each making about 4,000 tons.—*Dr. Bowring.*

Production of English Sulphur.—We are glad to find, on personal inquiry in the north, that the use of sulphur ores continues to gain ground, and that no fear need be apprehended of want of demand, without his Majesty the King of the Sicilies should determine on giving up the duty of £4 10s. per ton, with which he visits the article of sulphur exported from his dominions—a matter not very likely, while he has the markets of France, Russia, and America, to supply. We should not, however, be surprised, if in time we do not export even sulphur ores to other countries. We find that a preference is given to the Wicklow ores (which are now being raised in great abundance), the stocks having been worked off, and some contracts entered into, which will take up much of the ore raised in the next few months. The price continues to be maintained, and we think that a prudent course being observed by the miner, in accommodating his supply and prices to the state of the market, that the Sicilian sulphur never can compete with our home produce, while, at the same time, a remuneration may be secured to the miner, and a fair profit afforded to the manufacturer. Lancashire alone, we find, will consume 50,000 tons of ore annually, and hence we may reasonably expect, that the mines of Wicklow will find ample demand for their produce—at the same time, that Cornwall may contribute to the supply, the quantity consumed in Newcastle, Glasgow, &c., being considerably on the increase.—*Mining Journal.*

Agricultural Society at Bengal.—A meeting of the Agricultural and Horticultural Society at Bengal, on the 9th of September, is fully reported in the Indian papers. The first presentation to the society was a specimen of oven-dried plantains from Dacca, which raised a hope that the dried bananas of India might compete with the dried figs of the Levant. A sample of hemp, grown and manufactured in Bengal, after the Belgian manner, was the next presentation; it was accompanied by a letter from the presenter, M. Deneef, who stated that he considered it equal to the Russian and Manilla hemp, which fetches from £22 to £27 per ton in the English market. A specimen of undressed flax followed, of which the president said, that it was a sample of a large consignment coming from the Monghyr district, where an experiment of growing flax on a large scale had been undertaken. The grower was anxious to learn the sentiments of the flax committee on the quality of the fibre. A letter from Dr. Royle was then read on the subject of the grasses in India. In which he stated that rice, sorghun, Indian corn, and many other grains were suited to Bengal in the rainy seasons, while wheat, barley, oats, and millet were, during the cold months, suited to the plains of Northern India, and to the summer of the Himalayas. He said there were pasture grasses, peculiar to the table-land of Mysore, and to the plains of India and the Himalayas, at the same time stating that it was both advisable and practicable to introduce some of the gigantic pasture grasses of Brazil into Bengal, and of Italy into the north of India. The Himalayas, he said, possesses so many valuable pasture grasses that it is probable they will have more to give than receive. A resolution was carried for equalising the duty on rum, on the special ground that, whereas in no previous year more than 26,000 tons of sugar had been exported, in the present year the export would exceed 40,000 tons, showing the power of augmenting the culture of the sugar cane. Two letters were then read on the cultivation of cotton by the instrumentality of American agriculturists. The Americans are advised to go up to the north-west provinces of Bengal, and not to grow the western cottons on soil formed from the remains of trap formations. When these Americans have taught the natives how to gather cottons, it is recommended that the latter should be sent to teach other natives, and so on. A report on Arracan hemp stated that it would suit the home market well, and on a specimen of Rhea hemp sent from Assam it was observed, that it would answer admirably for cordage, nets, coarse and perhaps fine cloths, and, if more carefully prepared, would become an article of large export. A note from the Saugor district mentioned that the Georgian plants growing there were "beautiful."

Practical Effects of British Naval Gunnery.—In the official account of the taking of Acre published in the London Gazette, the following description is given of the effects of the firing from the ships on the batteries:—"Among those who surrendered themselves was the Polish Colonel Schultz, the chief engineer, who has been sent as a prisoner to Constantinople; he was wounded, and says it was quite impossible to withstand such an incessant stream of fire as was poured from our guns, which I found, on going round the ramparts with Sir Charles Smith, had torn and almost demolished many of the embrasures, and disabled the guns in such a manner that it did appear extraordinary that the garrison should have made so good a defence, for the state of devastation was beyond description."

Divisibility of Matter.—Matter may be divided to an almost incredible degree, as may be easily demonstrated by experiment. In gilding silver wire, a grain of gold is spread over a surface of 1,400 square inches; and as when examined in a microscope, the gold upon the thousandth of a linear inch, or one millioneth of a square inch, is distinctly visible, it is proved that gold may be divided into particles of at least $\frac{1}{1,400,000,000}$ of a square inch in size, and yet possess the color and all other characters of the largest mass. If a grain of coffee be dissolved in nitric acid, and then in water of ammonia, it will give a decided violet colour to 392 cubic inches of water. Even supposing that each portion of the liquor of the size of a grain of sand, and of which there are a million in a cubic inch, contains only one particle of copper, the grain must have divided itself into 392 million parts. A single drop of a strong solution of indigo, wherein at least 500,000 distinctly visible portions can be shown, colors 1,000 cubic inches of water, and as this mass of water contains certainly 500,000 times the bulk of the drop of indigo solution, the particles of the indigo must be smaller than $\frac{1}{2,500,000,000,000}$ the twenty-five hundredth millioneth of a cubic inch. A rather more distinct experiment is the following: if we dissolve a fragment of silver, of 0.01 of a cubic line in size, in nitric acid, it will render distinctly milky 500 cubic inches of a clear solution of common salt. Hence the magnitude of each particle of silver cannot exceed, but must rather fall far short of a billioneth of a cubic line. To render the idea of this degree of division more distinct than the mere mention of so imperfectly conceivable a number as a billion could effect, it may be added, that a man, to reckon with a watch, counting day and night a single billion of seconds, would require 31,665 years.—*Dr. Kane's Elements of Chemistry*, 1840.

Cornish Steam-Engines.—The number of pumping engines reported this month is 54. They have consumed 3,193 tons of coal; and lifted 30 million tons of water 10 fathoms high. The average duty of the whole is therefore 53,000,000 lbs. lifted one foot high by the consumption of a bushel of coal. Richard's stamps at Wheal Vor works with hot condensing water. The boilers are being changed at Trelawney's engine, Wheal Vor, and are leaky at Tincroft; Wheal Prosper; Cargise; Taylor's, Woolf's, and Bawden's engines, Consols; and at Hocking's engine, United mine.—*Lean's Engine Reporter, December* 11.

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HENRY FLOWER, Secretary.
J. B. SHEPHERD, Surveyor.

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Art-Union.
Athenæum.
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London Journal of Arts.
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Mechanics' Magazine.
Mining Journal.
Philosophical Magazine
Polytechnic Journal.
Railway Magazine.
Railway Times.
Repertory of Arts.
Transactions of the Society of Arts.

ACTS OF PARLIAMENT.

PATTERNS,—
27 Geo. III., c. 38; 2 Victoria, c. 13; 2 Victoria, c. 17. (The last relates to patterns and *models.*)

PATENTS FOR INVENTIONS,—
2 and 3 Victoria, c. 67.

SCULPTURES,—
38 Geo. III., c. 71.

ENGRAVINGS,—
7 Geo. III., c., 38; 17 Geo. III., c. 57.

COPYRIGHT,—
8 Anne, c. 19: 12 Geo. II., (Booksellers' Act), c. 36; 5 Geo. III, (Universities' Act), c. 53; 54 Geo. III. (General Copyright), c. 156.

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